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Unhealthiness of Hot Bread.

Dr. J. G. Bunting has published some very interesting and useful facts in relation to the digestion of food in the human stomach, deduced from his experiments with St. Martin, the man with an enlarged bullet hole in his side, through which can be seen all the processes of digestion. In speaking of the nutritious property of farinaceous food, and the proper state in which it is most easily digested, he gives the following excellent advice :—

"Hot bread never digests. Bear this in mind, reader, if you are accustomed to eat the light and tempting biscuit at tea, or the warm loaf which looks so appetizing upon your breakfast table. Hot bread never digests. After a long season of tumbling and working about in the stomach, it will begin to ferment, and will eventually be passed out of the stomach as an unwelcome tenant of that delicate organ, but never digests—never becomes assimulated to, or absorbed by, the organs that appropriate nutrition to the body. It is a first-rate dyspepsia-producer. The above is truth, as it has been repeatedly proved from actual observation through the side of Alexis St. Martin."

Telegraphing in England.

The Morse telegraph is used in England to some extent, but the signal telegraph of Cook & Wheatstone is the one that is most common, and it seems to be preferred on account of its simplicity. President Buchanan's last message was transmitted from Liverpool to London on three wires, at the rate of 3,500 words per hour, without a single mistake. The Queen's speech at the last opening of Parliament, was sent from London to Liverpool with one wire, at the rate of 32 words per minute. This is not quite such quick work, however, as has been accomplished on American telegraphs. Considerable attention is now being paid in England to a code system of signals (phonetic messages) whereby one-fourth, or less, the number of signs now employed for words, may be made to answer the same purpose. This is an important subject, as by a proper system of prepared messages, the power of the telegraph may be quadrupled.

To Save Gas.

The best way to regulate the flow of gas—and thereby economize it—to the burners, is not by the burner valves, but the main valve near the meter. When the gas jets are burning, this valve should be turned to regulate the flame to the proper length, with the burner valves freely open. The object of this is to reduce the total pressure in the pipe before the gas comes to the burners, so that some gas may not escape unconsumed, as is usually the case when the burner valve is used as the regulator.

ROOT'S ROTARY ENGINE.

Fig. 2

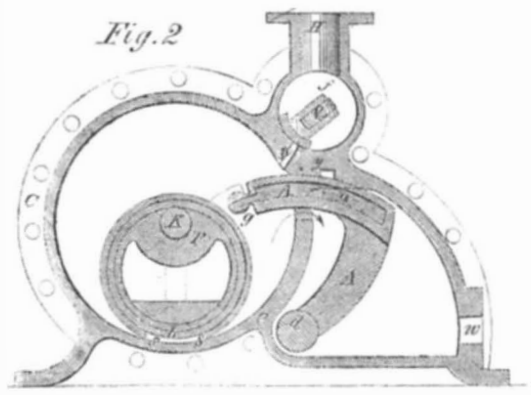
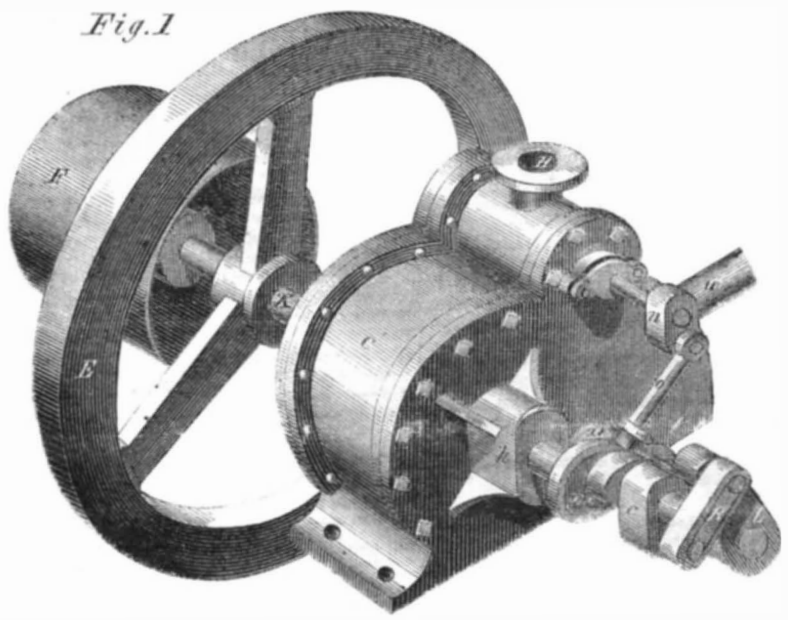


Fig. 3

Fig. 1



Great as is the value and utility of the reciprocating steam engine, there are even now many applications for which the form of engine called the rotary is better adapted; indeed, many sanguine persons believe that at some future time, which by the bye is very indefinite, the reciprocating steam engine will be entirely replaced by the rotary. There are, however, certain intrinsic advantages possessed by the rotary engine, such as lightness, cheapness, or rather the smaller cost of construction, and from its fewer parts a consequent reduction in the friction, together with all the superiority of using directly the force of the steam. The saving in fuel which is so loudly proclaimed by many, has not, we think, been fully made out, but that the rotary engine is destined to occupy a high place among the prime movers we have no doubt.

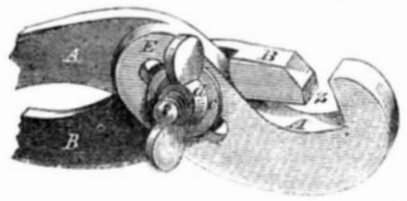
The subject of our engravings contains the above advantages in a marked degree, and from our description they will become apparent. Fig. 1 is a perspective view of the engine; Fig. 2 a vertical section, and Fig. 3 a detached section. The same letters refer to the same parts in each.

The steam is admitted into the valve chamber, *f*, through the steam pipe, H, and passes from thence through the opening, *p*, into the cylinder, and presses against the piston, P, and also against the top of the abutment, A. The force of this admitted steam, forces the piston round, and so turns the shaft, K, the piston being keyed fast upon the shaft. The end of the abutment inside of the cylinder is fitted within a "gib" or "shoe," *g*, with a knuckle or hinge joint, so that it may conform to the position of the piston, and always have a good bearing upon it. The abutment, A, oscillates on its axis, *d*, and it is worked by means of the crank, *c*, connection, R, and lever, L. The shaft, K, extends out through the head of the cylinder, and on the end of it the crank, *c*, is keyed, with the wrist or crank pin set exactly on a line with the center of the piston. The abutment shaft, *d*, also extends through the same head of the cylinder, and on the end of it is keyed the lever, L, with the pin in the top of the lever set on a line with or opposite to the hinge of the "gib" in the end of the abutment. The connection, R, is of the same length as the distance from the center of the piston to the center of the gib hinge, and as that distance always remains the same whatever the position of the piston, it will be seen that the motion of the abutment will be governed by the piston, and the shoe or gib on the end of the abutment made to follow exactly the circle of the piston.

The exhaust is through the opening under the abutment in the direction of the arrow; it passes the upright part of the abutment, (which is narrower than the chamber allowing room on each side for the steam to pass,) and passes off through the pipe, *w*. V is the cut-off valve which is operated by the crank or lever, *n*, *o*, and the eccentric, *x*, that can be set on the shaft, so as to cut off at any point of the stroke. The engine can be used with or without this valve. *b* are packing rings which are let into each end of the piston, and are held against the cylinder heads by springs under them, and they prevent steam passing between the piston and the heads, and they also protect the journal, Fig. 3; *h* being the shell, *e* the plumber block, and *m* a screw for tightning the journal; *y* is a packing plate let into the metal of the cylinder, and packs the top of the abutment across from one head to the other. S S is a packing shoe let into the piston, and kept tight against the inner circumference of the cylinder by means of springs pressing it out. E is the fly wheel, C is the cylinder, D the journal box of the abutment, and F the band wheel for conveying the power to any machinery to be turned.

From the above description, it will be seen that this is a compact and convenient form of rotary engine, and does great credit to its inventor, John B. Root, of Battle Creek, Mich. He obtained a patent for it Dec. 29, 1857, and will be happy to furnish any further particulars that may be desired.

Gilmore's Patent Adjustable Pipe Tongs.



These tongs are intended for grasping tightly pipes of different sizes; and they maintain such good hold that the pipe can readily be turned or manipulated in any manner that may be desirable.

The hooked jaw, A, and the short jaw, B, are constructed in the parts where the pipe is grasped, much after the usual and well-known manner; but the part of A through which the pivot, *e*, passes, is slotted and increased in size to compensate for the strength lost by the slot. The pivot, *e*, is secured in B, so that it can turn therein, or so that when *e* is prevented from turning, B can move about *e* as a center. There is a collar formed on *e*, and counter-sunk in B, which supports A, and is clamped between the collar and the washer, *c*, by the nut, *d*. *e* is flattened where it passes through the slot in A, for greater strength, and to prevent the pivot from turning therein. The inclined plane, E, forms part of A, or is fixed to it. The washer, *c*, is also an inclined plane, which is prevented from turning out of place by projections on the under side.

It will be obvious from inspection of the engraving, that any strain which tends to separate the two parts of the tongs in the direction of their length, or to increase the distance between the surfaces of A and the tempered steel edge, *z*, of B, must cause the inclined plane of *c* to move up on the inclined plane, E, increasing the distance between the upper surface of the collar and the lower surface of the nut. This cannot be done without stretching or breaking the pivot by direct tensile strain.

When much power is applied to the tongs, the nut, *d*, may become hard set. A light blow upon the end of handle, B, starts the pivot forward in the slot, and the tool is again ready for adjustment.

Tongs made of steel, to work $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1 inch pipe, weigh but four pounds; and three sizes will take the place of the ten sizes now required, and perform better, at great saving of expense for repairs, than the single tongs now in use.

The United States patent right (granted April 6, 1858,) is offered for sale by the inventor, who is in active trade, and has no time to devote to this business. A sample tongs may be seen, and particulars known on application to John Sawyer, No. 15 Gold street, this city, or at the office of the inventor, H. H. Gilmore, No. 149 Milk street, Boston, Mass.

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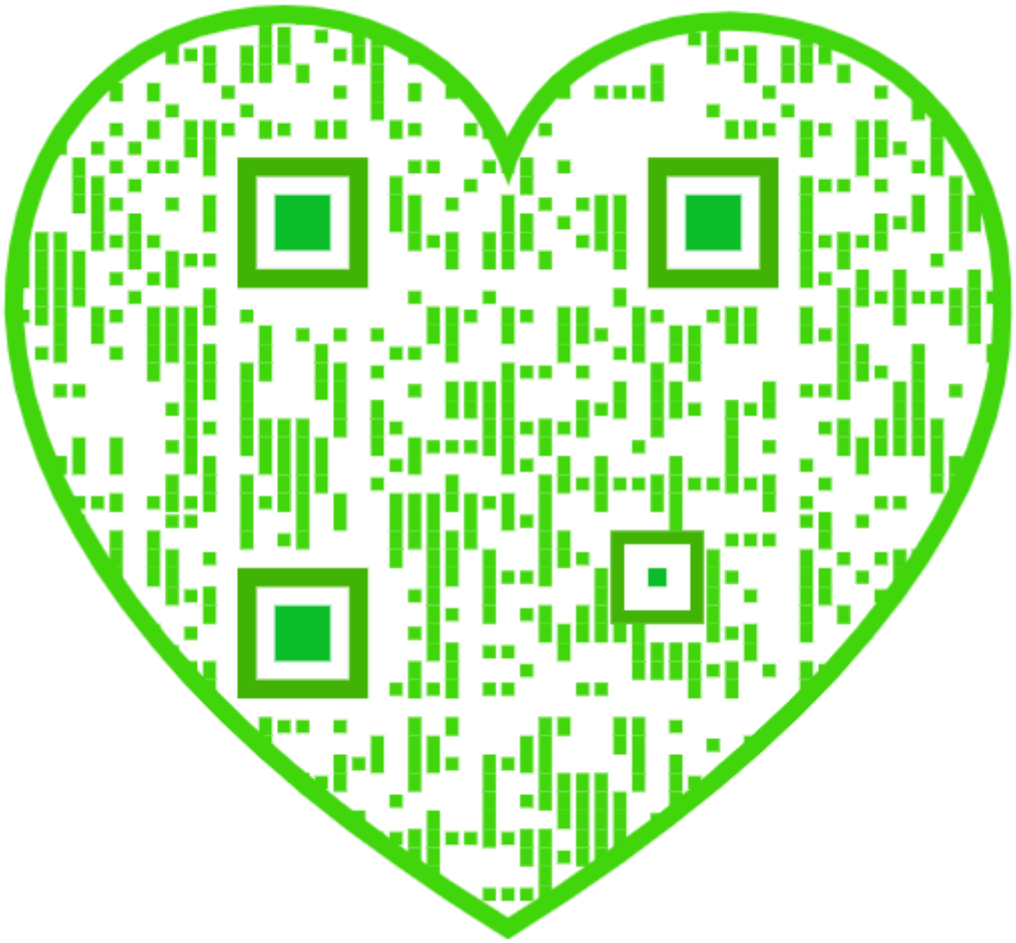

Issued from the United States Patent Office

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[*Reported officially for the Scientific American.*]

MUSICAL INSTRUMENT—John D. Akin, of Spartansburgh, Pa. : I claim the construction of the violins suspended on pins, w, and by cords, S S S S S, attached to keys, so that they may be brought in contact with the bows by depressing the keys, in the manner described, or any other substantially the same, and which will produce the same results.

TELEPHONIC INDICATOR FOR STEAM BOILERS—Thomas P. Akers, of Lexington, Mo. : I claim, first, Giving the peculiar specified form to the bracket, B, on which the float, C C', is suspended, for the purposes set forth.

Second, The precise manner specified of connecting the valve, D, with the float stem, C', by means of a lower extension screw-tapped stem, f, oblong slot, g, and adjustable screw nut. h, for the purposes set forth.

Third, Having the upper extension or stem, f', of the valve, extend up nearly through the alarm whistle standard, E, in combination with the providing of a set or valve-opening screw, F, in the upper end of said standard, E, and a valve-closing spring, G, on the lower extension or stem, f, of the valve, substantially as and for the purposes set forth.

[With this invention the fall of the water in steam boilers to a dangerous point will always be made known to the engineer, as the very falling of the water ensures the opening of a safety valve, and the escape and contact of steam with an alarm whistle. The same arrangement also enables the engineer to convey, by telephonic signals, the fact that all is ready for starting, or any other facts which are necessary, to avoid mistakes and accidents. It likewise affords facilities for examining the working condition of the alarm, and thus avoids any danger from the same not being in proper working condition. The arrangement, as a whole, is the perfection of simplicity and utility, and ought to be placed on every boiler, and thus prevent the sacrifice of human life daily occurring.]

MACHINE FOR ELEVATING, MEASURING, REGISTERING AND BAGGING GRAIN—Peleg Barker, of North Adams, Mich. : I claim the application to threshing machines of elevators, reservoirs, measures, and registers, which will elevate the grain, measure it, and discharge it into bags, without the necessity of handling.

I do not claim this particular kind of elevators and fixtures, but these or any others substantially the same, which will produce the desired effect.

LATTICE IRON FENCE—Albert Betteley, of Boston, Mass. : I claim uniting the bars of a lattice at their crossings, by suitable pieces having holes or tubes through them, at any desired angle with each other, but in different and parallel planes, which embrace the bars substantially in the manner set forth.

PLATE-HOLDERS FOR PHOTOGRAPHIC CAMERAS—Arend D. Bollengs, of Newburgh, N. Y. : I claim the continuous glass lining, a a b b, of the frame, constructed and fitted, and secured in the frame in the manner substantially as specified.

[This invention consists in a novel method of constructing a continuous glass lining, and fitting and securing the same in the frame of the plate-holder, to form a seat for the glass or other plate, to prevent the chemicals with which said plate is prepared from coming in contact with the wood, or other material of which the frame is made.]

MECHANISM FOR OPERATING SEMAPHORIC SIGNALS—William Boyd, of Washington, D. C. : I do not claim, broadly, signalizing by revolving signs or flags, whose position represent certain figures, letters, or numbers.

But I claim the particular mechanism described and shown for operating such signs or flags, when combined and arranged substantially as set forth.

ATTACHMENT FOR WATCHES, TO ASCERTAIN THE TIME WITHOUT LOOKING AT THE WATCH—Matthias W. Baldwin, of Philadelphia, Pa. : I claim the snail wheels, e and f, or either of them, the lever, g h i, the arm, k, and the segment ratchet, combined and arranged as described.

MANTLE BAR—William P. Chadwick, of Egartown, Mass. : I claim making the mantle bar, A, with an inclined back or bottom, as explained, and combining therewith a sliding or adjustable smoke chute, to operate therewith substantially in the manner as specified.

SASH FASTENER—Oliver Charter of Bristol, Conn. : It is well understood that lifts have been used for the purpose of raising windows, and also that spring fasteners have been used to hold and fasten the window sash; therefore such are not claimed.

But I claim the construction and arrangement of the lift, A, spring, B, thumb-piece, F, lever, D, and connection rod, E, operating substantially in the manner and for the purpose as described.

LUBRICATING CAR AXLES—John W. Cochran, of New York City : I claim the elastic rings, c, upon the roller, b, serving the double purpose of elastic bearing and oil conductors, as set forth.

PIPE TONGS—Aury G. Coes of Worcester, Mass. : I do not claim making the movable claw or jaw of a wrench adjustable, with respect to the stationary claw or jaw, by means of a screw on the shank of the latter, and a screw nut working on such screw, and so connected with the slide carrying the movable jaw as when rotated to cause the movable jaw to change position relatively to the stationary claw.

Nor do I claim pincers as ordinarily constructed, that is to say, in which each jaw or nipper forms part of one of two levers which cross one another, and turn on a common pin or fulcrum, whether the said fulcrum be movable in a slot in one of the levers, or not.

But I claim my improved pipe tongs or wrench, as made not only with its movable jaw, D, connected with a slider, C, embracing the shank, A, of the stationary jaw, B, and made adjustable thereon by a nut, E, and screw, a, as described, but with a lever, F, separate from the movable jaw D, and applied thereto and to the slider, C, substantially in manner as specified.

WASHING MACHINE—J. L. Conklin, Sen., and Joseph Foust, of St. Louis, Mo. : We claim the construction and attachment of the rubber, A, provided with parallel concave slats, C C C, when combined and arranged with the concave provided with diagonal slats, a a a, for the purpose of forming a washing machine, as is fully described.

SEWING NEEDLES—James Cottrill, of Studley, England. Patented in England, December 28, 1857 : I claim the sewing needle described as a new article of manufacture, that is to say, giving the space between the cutting edges of the triangular or equivalent formed needle a concave form, substantially in the manner and for the purposes described.

HARROWS—John S. Davis, of Washington, Ohio : I claim the arrangement of the harrows, A, with the frame, C D, the whole being constructed for operation conjointly in the manner and for the purpose set forth.

RAKING ATTACHMENT FOR HARVESTERS—D. O. De Wolf, of Brownville, N. Y. : I do not broadly claim imparting a circular or longitudinal motion to a rake by means of a cam, irrespective of the form of the cam.

Nor do I broadly claim elevating or depressing a rake by means of cams either attached to the rake or separate from the rake, irrespective of the devices employed by me, as fully shown and described.

But I claim, first, The employment of a cam, K, of the form described, in combination with the devices employed for operating or stopping the motion of the rake at the will of the driver, for the purpose of imparting a variable reciprocating motion to the rake, N, during the entire length of the platform, D, in a line at right angles to the course of the machine, as specified.

Second, Elevating and depressing the rake, in the manner and by the devices shown, and for the purposes described.

Third, The rake, as described, with the inclined rod, z, and the weight, a, combined and operating together, as described, and for the purposes as set forth.

[This is a novel means which is employed for operating a reciprocating rake, and a peculiar method of connecting the platform with the main frame of the machine, whereby an extremely simple and efficacious raking attachment is obtained, operating in perfect harmony with the other working parts of the machine.]

CARRIAGE BRAKE—George L. Dickson, of Carbondale, Pa. : I claim the arrangement as shown and described by the tongue, E, slotted levers, F, frame, C, box, D, and link, H, for the purposes set forth.

[A notice of this improvement will be found in another column.]

SEWING MACHINES—Martial Dimock, of Mansfield, Conn. : I claim the gripping apparatus, operating substantially as described, in combination with the needle and the thread, for the purpose of drawing the loop into the path of the looper, as set forth.

BRIDGES—Thomas Durden, of Montgomery, Ala. : I claim forming the arch of a series of metallic tubes, A, arranged transversely, and combined with blocks, B B, binders, C, bolts, a or b, and cores, f, substantially as shown and described.

[This bridge is composed of an arch made of iron tubes extending across the roadway, and connected with interposed blocks and wooden framing. It forms a very light and durable bridge.]

WOOD-BURNING STOVE—M. G. Fagan, of Troy, N. Y. : I do not claim broadly, or irrespective of the arrangement shown, a cylindrical stove provided with a circuitous draught passage, for such device has been previously used.

But I claim the extension, C, constructed similarly to the main portion, A, of the stove, and arranged substantially as shown, so that the stove may be extended when desired, for the purpose specified.

[This invention relates to an improvement in that class of wood-burning stoves which are of cylindrical form, and consists in so constructing the stove that it may be extended when necessary, so that when short wood cannot be readily procured, the stove may, with the greatest facility, be adapted to receive longer sticks. The invention also consists in a peculiar arrangement of the draft passage in connection with a damper, whereby a direct or circuitous draft can be obtained, as occasion may require. The invention also consists in a means devised for preventing the stove, or rather the fire, from scorching or burning adjoining wood-work at the back of the fire.]

HARVESTERS—Andrew B. J. Flowers, of Greenfield, Ind. : I claim attaching the frame or platform, G, and wheel, C, to a frame, A, substantially as shown, so that both may be turned or cramped by the driver from his seat, B, for the purpose of allowing the machine to be turned within a small compass.

I also claim operating the sickle, J, from the driving wheel, C, by means of the shafts, w C' 3, connected by universal joints. d', and attached to their respective frames, when said shafts thus jointed or connected are used in combination with the arrangement of the driving wheel and platform, so that the whole may operate conjointly, as described.

[This is an improvement in that class of reaping and mowing machines in which the team is placed behind the cutting device. The object of the invention is to obviate the difficulty of turning this class of machines, and also to simplify them, rendering them much less cumbersome than formerly, and at the same time retaining all the advantages of the ordinary side draft machines.]

BEE HIVES—Philander J. Furlong, of Galen, N. Y. : I claim the arrangement of the glass roof, A A, with relation to the cover of a bee hive, and to the conductors, C C', the whole being constructed and operated in the manner and for the purpose described.

SPRINGS FOR RAILROAD CARS—Heman Gardiner, of New York City : It is not my intention to claim as my invention the forming of a spring out of a fillet or plate folded back and forth; nor the use simply of auxiliary or intermediate springs in detached pieces. I am aware of the use of small springs, as described in the specifications of Holmes and Evans, and Clark and Proctor.

I am also aware of the plate described in the specification of D. B. Rogers, and that of Hill, patented in England.

But I claim the arrangement of the peculiar-shaped semi-elliptical springs, B B, in the form of a square shaped column, held in position and made to act as one spring by the folded steel plate, so as to give the long leverage and easy soft action, as described, the several springs and folded plate being combined and held together by the bolt passing vertically through them, as set forth.

COMPOUND RAILROAD AXLE—Heman Gardiner, of New York City : I claim the combination and arrangement of the hub cylindrical parts, c c, and axle parts, so that all may rotate together, or one wheel and short axle independently, as described.

SMUT MACHINES—John German, Jr., of Southfield, Mich., and S. R. Perkins, of Pontiac, Mich. : We are aware that smut mills have been devised so as to subject the grain, while passing through them, to two or more blasts; and we also are aware that rotating beaters and fluted cylinders have been used. But we are not aware that a fan has been used in connection with rotating beaters and cylinders, so arranged as to form a simple, efficient, and economical device, as described.

We do not claim, therefore, separately, and irrespective of their arrangement, the parts described.

But we claim the arrangement of an annular air space, c, between the cylinders, C D, with openings, h j k, as and for the purpose set forth.

[The object of this invention is to obtain, by the simplest possible means, a combination of a fan and beating device, so as to operate conjointly in the most efficient manner in cleansing the grain from smut, dirt, and the like.]

HORSE POWER—Micah Gillam, of Troy, N. Y. : I claim arranging or hanging the wheel, B, substantially as shown, or in any suitable way, so that the plane of its rotation may be variably inclined, for the purpose set forth.

I further claim the peculiar means shown and described for adjusting the wheel, B, to wit., its axis or shaft, D, being stepped in the shaft, E, to which the cross-tree, F, is attached, the cross-tree, F, being provided with friction rollers, G G, and connected with a lever, M, substantially as described.

[This is an improvement in that class of horse powers in which a rotating inclined wheel is used for transmitting power from the animal to the machinery to be driven. The invention consists in stepping the shaft of the wheel in an adjustable bar or shaft, whereby the wheel may be placed in a horizontal position, or in a position more or less inclined, and the speed of the wheel thereby regulated as required.]

MACHINES FOR CLEANING GRAIN—J. G. Goshon, of Mercersburgh, Pa., and William Powers, of Chambersburgh, Pa. : We make no claim to the employment of a disk scourer with upright beaters, separately considered, as such is not new.

But we claim the scourer composed of the spike studded disk, B, concave rim, E, and concave cap piece, F, as described, in combination with the brushes, H, and the casing enclosing the said parts, arranged and operating substantially as and for the purposes forth.

STEAM VALVES—Henry Goulding, of San Francisco, Cal. : I claim the loose collar on the piston rod, for the purpose of changing the valve after the blow is given.

SHOULDER BRACE SUSPENDER—Benjamin J. Greeley, of Springfield, Mass. : I do not claim the invention of either shoulder braces or suspenders, as they have both been long known and used.

Nor do I claim anything as set forth in Daniel Minthorn's patent, granted June 5, 1855, for "an improved brace for supporting garments."

But I claim the arrangement and combination of two straps of unequal length, joined and running over the shoulders and across the back, and attached at two points on the sides of the waistbands of pantaloons, operating as a shoulder brace and a suspender, substantially as set forth.

GRAIN CLEANING MACHINES—Marquis L. Hall, of Bridgeport, Conn.: I claim the arrangement of a series of flat steel springs or blades, placed horizontally and parallel with each other, and secured by a wedge or key in a slot or opening in the spindle, constructed and operating in the manner and for the purpose described.

BUOYANT LIFE-PRESERVING STATE-ROOMS FOR NAVIGABLE VESSELS—Henry Hallock, of Brookhaven, N. Y.: I claim the arrangement specified, whereby the state-rooms of boats are rendered capable of self-detaching in the event of the hull of the boat sinking, and when detached, of floating squarely upon the water, and of affording ventilation, light, food, and fresh water, and a means whereby their drifting can be controlled from the inside by the occupants, all for the purposes set forth.

[This invention consists in having the state-rooms of steamboats and ships so constructed and arranged that in case of the hull of the boat sinking, they shall be capable of automatically detaching from the same, and floating horizontally on the surface of the water, and thus serve as life-preservers for the passengers who may be on board. Each state-room is provided with water reservoirs, provision receptacles, ventilating and light passages, and every convenience necessary to preserve the health and life of its occupants. This appears to be a good contrivance, and worthy of the attention of those who have in charge the safety of the sea-traveling public.

WINDLASS—David D. Hammond, of Duxbury, Mass.: I claim the combination of the sector-shaped cams and movable cogged wheels traveling in guides, when attached to a bridle which actuates the pawl of the ratchet wheel of a windlass, as described.

COMBINED WASHSTAND AND NIGHT-STOOL—Francis W. Hamilton, of Conshohocken, Pa. : I claim the seat, E, as enclosed within a body or casing composed of the back, B, the two sides, C, and the door, G, in combination with the lid, H, and its drawer, I, the whole being arranged substantially as and for the purpose specified.

RAILROAD CAR BRAKES—Thomas Hopper, of Newark, N. J. : I claim lever, n, sliding bar, e, eccentric wheel, S, connected with lever, n, by means of a shaft and two universal joints, operated upon as specified.

I also claim brake rods, b b, connected from b to b by reversible fulcra transverse lever, t, attached to fulcrum, l, and operated by means of the main rod a, substantially as set forth.

COOKING STOVES—Marcus L. Horton, of Claremont, N. H. : I claim the arrangement of the register, C, dampers, D D, hot air chambers, O and M, and registers, H I and J, for admitting, controlling, and regulating the heated air, as set forth.

SIGNAL LANTERN—William Howard, of Flushing, N. Y. : I claim the arrangement of the conical reflector, B, with its large end placed towards the deflector, D, as set forth and described.

[This invention consists in the employment of a conical and convex reflector, so contrived and arranged as to form a chamber for the reception of the lamp, and at the same time throw the light in a concentrated form on a lens which is placed on the smaller end of the conical reflector. The rays of light, by being thus concentrated, are made to penetrate further than from any other lamp. Testimonials which we have seen speak of its powers in the highest terms.]

COTTON SEED PLANTERS—John. S. Huggins and Rowland Chapman, of Darlington District, S. C. : We claim the arrangement of the frame, A, and its furrow opener, B, ring, C, handles, D, braces, F, hook, G, brush, H, and cover, I, with the cylinder, K, and its receivers, N; discharge aperture, h, cavity, f, and fender, O, the whole being constructed for operation conjointly in the manner and for the purpose set forth.

MANUFACTURE OF BRICK—Thomas James, of Canton, Md. : I claim in the manufacture of fire bricks or tiles compounded of the ingredients described, the described process of heating or burning to convert said ingredients into a substantial fire brick or tile.

SELF-ADJUSTING AND VIBRATING BACK BAND STRAP—Robert Jancovins, of Newark, N. J. : I do not claim, broadly, the joints, hinges, or chain links, L.

But I claim the peculiar construction of the vibrating sector, B, provided with the slot, E, the pointed back support, D, with the pin D', attached, the whole in connection with the several joints, hinges, and link, L, or their equivalents, for the object and purposes set forth and described in the specification.

GAS APPARATUS—E. J. Manville and Saml. G. Blackman, of Waterbury, Conn. : We claim the peculiar combination and arrangement of the fire chamber, the retort and the condensing chamber, substantially as set forth.

We also claim combining the descending toothed flanch, f, with the cover of the condensing chamber for the purpose of dividing said chamber into two compartments which communicate with each other by means of a series of small induction apertures at the surface water, substantially as set forth.

BEDSTEAD—Wm. B. Johns, of the United States Army : I claim the combination of slats, posts, and screw bolts, substantially as and for the purposes set forth.

HINGE FOR DAGUERREOTYPE AND OTHER CASES—E. G. Kinsley and S. A. W. Parker, Jr., of Stoughton, Mass.: We do not claim a hinge of common construction, or one having each of its leaves bent at a right angle in order that it may be inserted in a mortise, made in the side of a case or box.

Nor do we claim so applying a hinge to a daguerreotype or picture case molded of a plastic material or made of frangible substance, or substances, that such hinge may have each of its leaves bent twice, and so applied to the halves of the box as to embrace two contiguous sides of them and be independent thereof, or not have any tenon, or projection to enter the same, but extend or lap over, and be fastened to the top and bottom plates of the said box.

But we claim our improved mode of arranging and applying the hinge with reference to the side and end, or the end and the bottom of either half of the box, that is extending the hinge leaf through the side of the half, and against the inner surface of its end or the same, and the inner surface of the bottom, and fastening such leaf to the end, or to the end and bottom, the whole serving to attain advantages as specified.

HORIZONTAL WATER WHEEL—John McCarty, of Catharine, N. Y. : I do not claim, broadly, the operating of all the gates simultaneously. I am aware that many horizontal center vent wheels have been devised, and I am also aware that four chutes have been employed to let the water on the wheel at opposite points of its shafts for the purpose of preserving the equilibrium of the wheel. I therefore do not claim, separately, the chutes, K, nor do I claim, broadly, a center vent or center discharge wheel.

But I claim, first, The buckets, F, constructed of the form specifically as shown and described for the purpose set forth.

Second, I claim, in combination with the buckets thus formed the four chutes, K, arranged as shown and described.

Third, I claim the manner of operating the gates, L, the same being curved and attached to the levers, M, as shown, and connecting the levers, M, with the rising and falling frame, O, the parts being arranged as described for the purposes set forth.

[The bucket in this water wheel is so formed that the water is retained or allowed to act sufficiently long against the buckets, so that they may receive its full effective force, and is then discharged at the center of the wheel. Four shutes are employed, arranged relatively with the buckets and wheel, so that the water will be properly presented or conducted to the buckets, so as to act in the most effective manner. There is a novel and peculiar mode of operating the gates and arranging them.]

STRAW AND WOOD OVERSHOE—F. W. Michel, Wm. Willcox, and H. T. Miller, of Utica, N. Y. : We claim the straw overshoe, constructed in the manner and for the purposes mentioned.

SEED PLANTERS—Elmon Parker, of Baltimore, Md. : I claim the arrangement of rods, n k, and their springs, p L, with the cams, J m, the whole being constructed substantially as and for the purpose set forth.

MACHINE FOR MAKING HORSE SHOES—C. H. Perkins, of Putnam, Conn. : I claim, first, The combination and arrangement of the hammer, K, and the creaser, L, with one rotary tripping shaft, I, so as to be operated thereby substantially in the manner and for the purpose specified.

Second, I also claim the mode of constructing and operating the former, B, that is, making said former with the vertical edge, g, and beveled top surface, x, and causing the said former to take two separate positions with respect to the benders and hammer in manner and for the purpose set forth.

Third, I also claim constructing the bed or anvil, A, with the projection or die, w, for hollowing the shoe or making it concave in rear of the toe as specified.

Fourth, I also claim the combination of the straight toe die, b, with the benders, C C, and the former, B.

Fifth, I also claim the combination of a set of notches or their equivalent, with the rear end or toe or other proper part of the former, and for the purpose of maintaining the shoe blank in its proper place or position with respect to the former during the process of bending the shoe thereon.

Sixth. I also claim, in combination with mechanism for giving to the hammer shaft its tilting or vertical motions, mechanism for rotating the shaft, at the proper times, in order to bring the hammer and creaser to operate alternately on the shoe, as spectfied.

Seventh, And in combination with the mechanism for tilting and turning the hammer and creaser shaft, I, claim the mechanism for arresting the operations of the tilting meehanism, and for preventing the fall of the hammer shaft long enough to allow of a semi-rotation of the hammer shaft. and the withdrawal of the made shoe from its place about the former, and the substitution of a shoe blank therefor.

PUMP—S. S. Putnam, of Boston, Mass. : I claim the single cylinder, A, with its partition head, D, in combiuation with the pistons, M and N, operating in the manner substantially as set forth.

PUMP BUCKETS—Emmett Quinn, of Trenton, N. J. : I claim the central diaphragm, e, having its under edge concentric with the connecting pin of the rod and in contact with the bottom of its jaw, in combination with the valve, V', constructed and operating so that the diaphragm receives the pressure on the valve and transmits it directly to the piston rod.

I also claim the combination of the dovetail recess in the metallic core, with the plug penetrable by nails filling the same for the more easy and economical attachment of the valve and packing, as described.

TRUSS PADS—H. H. Reynolds, of Buffalo, N, Y. : I claim, first, The transverse vertical projection, B, for purposes and substantially as set forth.

Second, I claim making the pad concave below its vertical projection as represented at c, for the purposes and substantially as described.

Third, I claim corrogating the oval face of the pad, for the purposes and substantially as set forth.

SMOOTHING IRON—Abraham Rudisill, of York, Pa. : I claim the smoothing iron, with concave pressing surface, constructed substantially as described.

LATHE FOR TURNING METAL SHAFTING—Wm. Sellers of Philadelphia, Pa. : I claim, in combination with rotating cutters substantially as described, the employment of a guide bar and sliding chucks or their equivalents, for the purpose of keeping the rough bar in the line it is intended to have when finished, and preventing it from turning or vibrating during the operation, substantially as described and for the purpose specified.

WHITEWASH BRUSH—D. W. Shaw and Wm. A. Megraw, of Baltimore, Md. : We claim the arrangement of the metallic box, with two or more divisions and slotted ends and the center or wedged shaped bar for dovetailing the end of the bristle, and a movable or top plate fastened by pins or screws, for the purposes specified.

GAS RETORTS—W. A. Simonds, of Chelsea, Mass. : I do not claim, broadly, the invention of double chambered retorts, whether the said chambers are placed side by side or separately. Nor do I claim a tubular retort connected at either end by joints and plugs.

But I claim, first, A common coal retort, A, with a separated return chamber, B, above and outside, but connected at the back end with the lower chamber, A, when the whole is made in one piece and forms a continuous retort, as set forth.

Second, I claim placing an escape pipe, b, directly under the stand pipe, E, which conducts the gas to the hydraulic main, for the purpose of drawing off the tar.

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and preventing it from returning to the retort, B, to crystallize and clog up the said retort.

[A full description of this invention is given in another column.]

THRESHING MACHINES—H. E. Smith, of Philadelphia, Pa.: I claim arranging the concave of a threshing machine in respect to the spiked roller, substantially as set forth, in order that the grain may be operated in the manner specified.

COOKING STOVES—James Spear, of Philadelphia, Pa.: I claim, first, The adjustable hollow front and middle center pieces, A and B, perforated on the lower side, arranged and constructed in the manner set forth and for the purpose described.

Second, I claim the curved plate, D, with lip, i, when connected with front plate, H, and top plate, G, and hollow center piece, A and B, or their equivalents, constructed in the manner and for the purpose set forth.

Third, I claim the hollow covers, M M, constructed in the manner set forth and for the purpose set forth.

Fourth, I claim the combination of the covers, as constructed with the center pieces as constructed, substantially as set forth.

SPITTOON—Wm. Staehlen, of Williamsburgh, N. Y.: I do not claim a lid attached to the spittoon, and so arranged as to be actuated by a treadle, for such device has been previously used or applied to spittoons.

But I claim arranging the treadle, c, relatively, with the loaded base or foot, e, substantially as and for the purpose set forth.

ROLLERS FOR RAILWAY BARS—E. W. Stephens and Richd. Jenkins, of Covington, Ky.: We claim the combined arrangement substantially as represented of the horizontal and vertical rollers, a b c, and d d, when finished with grooves as represented, substantially for the purposes mentioned in the specification and represented in the drawings.

MANUFACTURE OF GAS—John L. Stewart, of East Boston, Mass.: I claim mixing the gases from the several retorts of a series alternating in one or other of them and charging the retorts successively at stated intervals, as set forth, when the retorts are arranged with valves and passages of communication with each other, whereby the gases of different qualities are commingled before being cooled as described, for the purpose specified.

Second, I claim conducting the gas from one retort to the other through a non-conducting stopper, or other equivalent device temporarily inserted in the mouthpiece, as set forth.

HOT AIR FURNACES—Jacob Stuber and F. Frank, of Utica, N. Y.: We claim the arrangement of radiators, B, constructed as described, connected at the lower end with the chamber, G, and by the pipes, C, with the perforated plate, F, and the cleaning box, D, with funnel, e, all constructed and operating substantially as set forth.

MACHINERY FOR HOISTING AND LOWERING GOODS, &c.—George Thompson, of Cincinnati, Ohio: I claim first, The use of windlass, H, one or more, whether parallel or tapered, corrugated or grooved in combination with the traveling frame, for the purpose set forth.

Second, I claim the use of the brake, P, or its equivalent, for the purpose substantially as described.

WATER WHEELS—John Tyler, of West Lebanon, N. H.: I claim combining an elevated air tight cap with the casing and shaft of a water wheel whose buckets descend from a close head for the purpose of enabling said wheel to be operated without loss of power when entirely immersed in back water, and also for the purpose of furnishing an independent upper bearing to the shaft of said wheel of so firm a character as to enable said wheel to be connected directly to the machinery to propelled thereby, without any auxiliary shafting or journal boxes, substantially as set forth.

I also claim combining the flanched box of a sliding gate with the mouth of the water way of my improved water wheel, for the purpose of enabling a number of said wheels to be readily bolted to a wooden water tube or trunk, and to be operated independently of each other, substantially as set forth.

HARVESTERS—D. B. Waite, of Spring Water. N. Y.: I claim, first, Operating the sickles, m m, by means of the levers, L L, attached to the bar, H, the rods, n n, and lever, M, actuated by the cam, O, the parts being combined and arranged relatively with each other, substantially as described.

Second, Attaching the sickles, m m, to the adjustable bar, H, arranged as shown, and used in connection with the lever, I, whereby the sickles may be raised and lowered with facility.

Third, Pivoting the oscillating lever, M, to the bar, N, which is arranged as shown, so that the lever, M, so that the lever, M, may be thrown in and out of gear with the cam, O.

Fourth, The sliding plate, F, placed on the frame, A, and arranged substantially as shown, so as to regulate or control the draught pole, and consequently the position of the sickles as occasion may require.

[This invention consists in a novel arrangement of means for operating the cutting device, and an arrangement of parts for raising and lowering the same: also in a peculiar arrangement of parts, whereby the device by which the cutting device is operated may be readily thrown in and out of gear. The invention further consists in a peculiar means employed for regulating or controlling the draft tube as regards its vertical motion or position.]

MACHINES FOR WORKING MARBLE—Caleb Warner, of Washington, D. C.: I claim the arrangement of the saws, f f, bevel gearing, a a′, and feed screws, b b, when employed in combination with a lathe, consisting of head blocks, g g, pulleys, h h, substantially as described, for the purpose of facilitating the working of marble or other hard stone, in the manner and for the purpose set forth.

SPOKE SHAVE—C. H. Weston, of Nashua, N. H.: I claim, first, The plate, B, provided with arms, b b, so as to operate substantially as set forth in combination with the fulcrum arms, a a, and thumbscrew, G, and projections, d d, both as a cap and holder to the cutter, c.

Second, Making the cap or holder, B, adjustable by means of knobs, e e, and holes, 1 2, or their equivalents, that it may operate either as a simple cap and holder to the cutter, C, or in combination with it as the upper iron of a double iron plane, substantially as described.

MANUFACTURE OF PLIERS—Henry Wilkinson, of Collinsville, Conn.: I do not claim the nipple joint, or its adoption.

But I claim the mode of constructing malleable iron pliers, by casting one half over the other in the manner described.

HORSE POWER—T. H. Wilson, J. E. Wilson, J. F. Wilson, and R. J. Wilson, of Athens, Ga.: We claim the annular tread or way, A, wheels, C, any proper number being used and attached to axles, D. and the wheel, E, the whole being arranged to operate as and for the purpose set forth.

[A series of driving wheels are fitted on to an annular tread or way, and attached to radius axles connected at their inner ends, a wheel from which the power is taken being fitted on the driving wheels, the latter wheels rotating the former one with an increased speed due to their combined forward and rotating movements.]

MILL-STONE DRESS—Samson Wolff, of Vicksburg, Miss.: I claim dressing mill-stones with elbow-shaped furrows, A and B, which are partly concave in their transverse section or curved as shown at a, and partly beveled in the same section as shown at b, and so constructed that all the feather edges, c c, of the main furrows radiate from the center of the eye. B, of the stone, and that the elbows, d d, or commencement of the angles are at a point nearer the circumference than the eye of the stone, substantially as and for the purposes set forth.

[By this method of giving the furrows a concave form in their transverse section from their commencement to their angle or elbow, they are made deeper and more roomy, and the grain is not liable to choke the action of the stones, and a rolling action is imparted to the flour, and the flour thus kept cool near the eye of the stones. And by giving the furrows a bevel form in their transverse section, from their elbow or angle to the circumference of the stones, they are made shallower between these points, and consequently the draft is not so great and the discharge of particles of grain with the flour does not occur. The accomplishment of these two objects in mill stones, as every practical miller is aware, has long been considered an important desideratum.]

CONSTRUCTION OF WOODEN SADDLE TREES FOR HARNESS SADDLES.—F. P. Ambler, Jr., of Trumbull, (assignor to F. P. Ambler & Sons, of Bridgeport,) Conn.: I do not claim broadly the employment or use of a raised seat of harness saddle trees irrespective of the material used and the construction of the whole viewed as a new and useful article of manufacture.

But I claim a saddle tree having a separate or independent raised seat of wood, made substantially as shown and described.

[See description of this invention on another page.]

RAILROAD CHAIRS—Elizur Barnes, (assignors to Edward Crane,) of Dorchester, Mass.: I do not claim the use of elastic cushions under the rail, nor the use of movable lips, they have been used before.

I claim, first, the use of elastic cushions over the web of the rail, in such manner as to counteract the reaction of any downward force upon the rail, or any lateral thrust or pressure upon it substantially as described.

Second, The confining of the rail between elastic cushions placed above the web of the rail and under the base of the rail under such a pressure that the rail will not be sensibly depressed by the weight of an engine or train passing over it, and a constant tension will be maintained upon the screws which confine the rail substantially in the manner described.

Third, The mode of bringing the upper surfaces of the rail to an exact level by the compression of the elastic cushion on which the rail rests, and the whole device arranged and operating as described.

STOVES—J. S. Brown, of Washington, D. C., (assignor to himself and Joseph Kent, of Baltimore, Md.): I do not claim simply heating the draft air before it reaches the fire chamber.

Nor do I claim heating the draft air by contact with a smoke passage situated within the stove, the application of my invention being only to a smoke passage situated outside of the stove, that is to what is understood by the term smoke pipe.

Therefore I claim introducing the air which supports combustion of the fuel in the stove, through, around, or otherwise in contact with the smoke pipe, whereby a portion of the heat escaping through said smoke pipe is utalized in improving the combustion of fuel.

I also claim the valve, I, arranged and operating in combination with the draught pipe, c, substantially as specified.

APPARATUS FOR DISTILLING TURPENTINE—Leonard Bellingrath, Jr., (assignor to Duncan and Wm. McLaurin and Jas. W. Strange,) of Fayetteville, N. C.: I claim the arrangement of the inclosed air space between the alembic and outer jacket or case when said air space is furnished with air passages and an indicator of heat, so that the inclosed air may be heated by conduction instead of by the direct application of the fire as set forth.

CORN PLANTERS—Augustus C. Carey, of Ipswich, (assignor to himself and Alfred B. Ely, of Newton,) Mass.: I claim the described arrangement of mechanism operating independently of the carrying wheels of the machine for the purpose of spacing off the distances between the hills, that is to say the roller, K, the arms, M and N, and the piece, O, arranged and operating in the manner described for the purpose set forth.

RAILROAD CAR BRAKES—G. W. Cummings, of Philadelphia, (assignor to D. K. Jackman and Joseph Hanna, of Lock Haven,) Pa.: I claim, first, the combination of the draw head, c, dog, p, pushing rod, L, crank, H. shaft, E, crank, I, rods, K, and blocks, F, when the several parts are arranged to operate as and for the purpose as specified.

Second, The mechanism for throwing lever, L, out of gear, consisting essentially of the rod, D, chain, N, and stationary pulley, O, the whole arranged and operating as set forth.

DRILL FOR GAS PIPE—Wm. Daggett, of Troy, (assignor to A. B. Davis, of New Lebanon, and W. H. Tolhurst, of Troy,) N. Y.: I claim, first, the combination of the light and heavy springs. D C, and adjustable follower, E, with the drill spindle, B, and stock or frame, A, substantially as described for the purpose of controlling and regulating the endwise movements of the drill spindle as specified.

And I also claim the clamp, F, composed of the adjustable jaws, d d, and foot, E, as described, when combined with the drill stock for securing the latter to gas and water pipes as set forth.

MACHINE FOR WRINGING CLOTHES—Edwin Hager, of Frankfort, (assignor to himself and T. D. Aylsworth, of Ilion,) N. Y.: I claim the clasp, B, and its attachment and adjustment to the tub as described and shown, the whole being arranged and operating substantially in the manner and for the purpose set forth.

SEWING MACHINES—Chas. A. Shaw and Jas. Clark, of Biddeford, and David T. Giveen, of Saco, (assignors to Shaw & Clark, of Biddeford,) Me.: We do not claim the wheel, 21. cam, 14, lever, 13, slide, 1, spring, 20, slot, o, needle, e, or spool, 19, or dog, 6, as the same are in common use and not patentable.

We also disclaim the use of two threads and the stitch formed by their combination in the manner described.

Also all and any part or parts of the mechanisms described when those parts are in and of themselves separately considered, which are not of our invention.

But we claim the combination of the looping mechanism described, whereby the forward and backward lateral and reciprocating rotary movements are given to the looper for the purpose described and specified.

RAILROAD CHAIRS—Theodore Krausch, of Susquehannah Depot, Pa.: I do not claim for my invention the particular form of chairs described, alone.

But I claim the adaptation of a chair to, and the use of, transverse wedging as above described, or by gibbs, or if in one, two, or more parts by bands or by whatever other mode transverse wedging may be accomplished.

RE-ISSUE.

MODE OF CONNECTING THE STEAM CYLINDER WITH STEAM CHESTS—Frederick E. Sickles, of New York City. Patented September 19, 1845: I do not claim Letters Patent simply for casting the steam chests in one piece with the cylinder, as that would not effect saving of steam unless in connection with a new mode of construction by means of which the greater part of the nozzles is dispensed with.

But I claim so constructing balance puppet valve engine steam chests, that a portion of the outside of the cylinder forms a portion of the inside of the chest, having the plates which contain the upper and lower valve seats cast directly upon the cylinder substantially as described, thus dispensing with the nozzle and nozzle flanges and saving steam heretofore lost by reason of their interposition between the chest and cylinder as described.

ADDITIONAL IMPROVEMENT.

ROTARY BLAST-PRODUCING CHAIR—Leopold R. Breisach, of New York City. Patented February 16, 1858: I do not claim the arrangement of a rocking chair with one pair of bellows fastened above, under the seat, or like a coach rack, behind it, and to be worked upon by a kind of pump handle, and this one pair of bellows to be opened by the heavy weight of its under part to produce interrupted currents of air. But as the additional improvements to my patented rotary chair with its mechanism of drawing in the air and forcing it out at the same time in order to produce constant currents of air—

I claim the arrangement of the two bellows, one of which is on the front and the other on the back part of the rocking chair, and the use of the S-formed levers placed parallel to the rockers, the parts constructed and arranged substantially as and for the purpose specified.

DESIGNS.

AQUARIUMS—A. L. Blanchard, of Albany, N. Y.

FONT OF TYPES—James Connor, of New York City.

COOK STOVES—E. J. Delaney & J. Martino, (assignors to W. P. Cresson, D. Stewart, and R. Peterson,) of Philadelphia, Pa.

ORNAMENT IN BAS-RELIEF FOR STOVES, &c.—Geo. F. Seavey, of Boston, Mass.

SEWING MACHINE STANDS—James Willcox, of Philadelphia, Pa.

Lightning and Milk.

MESSRS. EDITORS—It may not be generally understood by scientific men, but it is well known to dairy men and housewives that a violent thunderstorm turns sweet into sour milk. To ascertain whether electricity has any direct agency in producing this result, I passed a current of electricity from a Daniel battery of three cells through a bowl containing fresh milk, the connecting wires leading to and from the milk being copper. I enclose you so much of the terminal point of the wire from the positive pole of the battery, as was immersed in the bowl. You will observe that it is encrusted with coagulated milk, through which is diffused a very perceptible quantity of sulphate of copper. The other end of the wire in the milk connected with the negative pole of the battery, and through which the current of electricity flowed from the milk, presented no such appearance—it was clear and unaffected. The only perceptible effect from this wire was a line of froth about half an inch broad, directly over the wire, and in the form of an S, similar to the bend of the wire, while no such effect was produced over the surface of the other wire. In three hours afterwards, this milk was tested with litmus paper, and compared with another dish of milk taken from the same source. No more acidity was shown by one than the other of these quantities of milk, and the cream rose with equal regularity on each. I therefore concluded that electricity has no direct agency in turning sweet into sour milk during a thunder storm. Is the agitation produced by the concussions of thunder storms the cause of milk souring? Do the discharges of artillery produce the same effect?

The specimen of the terminal point of the positive conducting wire shows that the current flowing into the milk through the copper wire formed sulphuric acid around it, by which the more solid portions of the milk (cheese and butter) were then collected, and a portion of the copper converted into a sulphate. The experiment was several times repeated, and always with the same result. During the formation of the incrustation, a line of points was always thrown upward. When platinum was substituted for copper as the terminal point of the positive pole in the milk, no such effect was perceptible, as was seen with the copper. This was really but an initial experiment, which should be followed up by others who have more time to make them than Yours truly,

J. D. CATON.

Ottawa, Ill., May, 1858.

Two questions are asked in the foregoing communication regarding atmospheric agitations by thunder and artillery discharges, in causing milk to turn sour. We cannot answer them from practical observation, although it has long been known to us, and almost every other person we suppose, that milk is liable to become sour during thunder storms. We attribute this influence to the state of the atmosphere, not the thunder concussions, as it is well known that the weather is generally sultry or hot just prior to a thunder storm, and this warm condition of the air is very favorable to the development of lactic acid in the milk. It was this acid which, in the foregoing experiments, united with a portion of the copper in the wire and formed the lactate, not the sulphate of copper, as mentioned, because there was no sulphuric acid present to form the sulphate We hope that such experiments will be extended by others, as recommended by our correspondent, for the field for investigation is interesting and expansive.

[After the foregoing had been put in type, we received another letter from Judge Caton, in which he says that the above one was written in haste, and he omitted to state that in his opinion the sourness of milk caused during thunder storms was probably owing to the temperature and condition of the atmosphere, views which accord exactly with those we have expressed.

We have noticed a paragraph in the columns of several of our cotemporaries, in which it is stated that some experiments had been made at Cincinnati with sweet milk, by passing currents of electricity through it, and that the butter by the operation was separated or churned in the most complete and perfect manner. Such statements are not worthy of the confidence of the above communication.]

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims:—

GAS RETORT.—This invention consists in combining with an ordinary horizontal gas retort, a secondary retort, arranged horizontally above the ordinary retort, which for distinction may be termed the main retort, in such a manner that both are exposed on all parts of their exterior to the heat of the furnace, the two being connected at their rear ends, and the secondary retort connecting at the front end with the stand pipe, which has no direct connection with the main retort. The object of this improvement is, that the greater proportion of the tarry vapors escaping from the main retort may be decomposed and converted into permanent gas in the secondary one, and hence that more gas and less tar may be produced. An escape pipe is also employed in connection with the secondary retort, arranged below where the stand-pipe connects with it, and it is provided with a cock which is to be opened from time to time to draw off any tar that may accumulate in the secondary retort below the stand-pipe. The invention further consists, when the ordinary horizontal gas retort is to be employed, wholly or in part, in the manufacture of rosin gas or oil gas, in a certain mode of attaching the pipe through which the rosin or oil is fed to the retort to the ordinary movable head, which enables the common coal gas retort to be adapted readily to the manufacture of rosin or oil gas without any danger of burning the feed pipe, and enables the feed pipe to be detached from the retort with the head, so that the pipe may offer no obstacle to the cleaning of the retort. W. A. Simonds, of Chelsea, Mass., is the patentee.

CARRIAGE BRAKE.—This brake is intended for vehicles which are drawn by horses, and the invention consists in having the draught poles and shafts of vehicles so arranged that a certain degree of longitudinal play or movement is allowed them, the back ends of the poles or shafts being attached to levers which have shoes at their ends; the parts being placed in such relation to each other that the shoes are pressed against the wheels as the speed of the horses is checked, or as the horses are "backed," and the brake is therefore self-acting. G. L. Dickson, of Carbondale, Pa., is the patentee.

SADDLE TREE.—F. P. Ambler, Jr., of Trumbull, Conn., has invented an improved construction of wooden saddle tree, whereby a raised and perfectly formed seat is obtained, and the labor of constructing the saddle greatly expedited and facilitated, so that any mechanic, even if possessing but ordinary ability and little taste, may be able to make a good and well-proportioned saddle.

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New Inventions.

Hoisting and Storing Ice.

W. G. Brower, of Stoutsburgh, N. Y., has invented, and patented last week, a new machine for this purpose. The invention consists in the employment of a vertically sliding receptacle or box, provided with a door or flap. and connected with a windlass, which is arranged with a clutch and spring catch. These several parts are so combined that by the rotation of the driving shaft, the receptacle or box will be elevated, the ice discharged therefrom, the box allowed to descend and again elevated and so on, the several parts working automatically by a continuous application of the driving power.

Improved Car Axle Bearing.

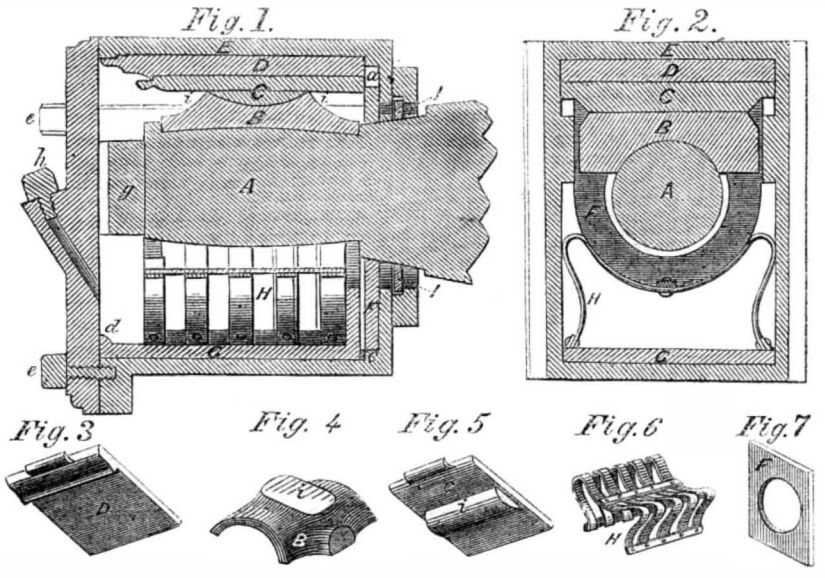
This is an improved bearing for the axles of railroad cars, the numerous advantages and features of novelty in which will appear by reference to the following description and the accompanying illustrations, in which Fig. 1 is a vertical longitudinal section, and Fig. 2 a transverse vertical section of the invention.

A is the axle of the car wheel, and B the box which rests upon the upper side of the journal of the axle. This box is also seen separate in Fig. 4. C is a wedge or key that rests upon B, clearly shown in Fig. 5, where the projection, *i*, is indicated, that fits into a corresponding depression, *i*, in B, D is a wedge plate that fills the space between C and the outer case, E; this is seen at Fig. 3. The outer case, E, is made of the usual form, and properly attached to the pedestal of the truck of the car in the usual manner. The front end of this case is covered by a plate that is secured to the case by screw bolts, so that by removing this plate, and relieving the pressure of the car, tbe box, B, and wedges, C and D, together with other parts, can be removed or replaced at pleasure, without disturbing the position of the truck or of the case, E. With ordinary boxes it is necessary to detach the pedestal from the car frame, and then remove the journal box from the axle in order to inspect or repair the different portions of the box. Fig. 7 is a view of a self-adjusting washer of leather that fits closely upon the back part of the journal of the axle. This collar or washer, F, does not reach quite to the top of the outer case, leaving a space, *a*, so that in the wearing away of the box, B, this collar or washer moves upward with the axle, and continuing to fit closely around the axle prevents the escape of oil or the admission of sand or dust into the cavity of the case, E.

For the purpose of preventing the oil from passing behind the collar, F, a packing, *c*, is introduced, which runs along the base of E, and up the two sides of the washer, F. and it is pressed firmly against the back part of the case, E, by means of the slide partition, G. Fig. 6 represents the syphon spring shown also at H, Figs. 1 and 2, waste cotton thread or wicking is woven into this, by means of which the oil in the case, E, is carried by capillary attraction to the under surface of the journal, A, with which the wick is in contact. At the back part of the case, E, where the journal passes into it as seen at I, the usual mode of packing is introduced, but as this is stationary in the case, as the box, B, wears away the packing wears also, leaving an open space upon the under side of the journal, through which, in the usual form of construction, the oil passes into the cavity of the case and escapes, while dust and dirt freely enter. In this mode of construction all this difficulty is obviated. The slide partition, G, when placed in its proper position in the case, E, is pressed firmly against the elastic leather packing, *c*, by means of the pressure of the front plate of the case, E, upon the horizontal wing, *d*, of the slide partition, when the front plate is brought home to its place by the screws, *e*. A gasket should be introduced between the front plate, and case, E, for the purpose of making the chamber oil tight. Upon the inside of the front plate there projects a flange, *g*, that is nearly in contact with the end of the journal, A, for the purpose of preventing end-chasing of the axle. The oil is introduced into the box by the hole, *h*, which is kept closed by a plug.

In the construction of railroads it is impossible to avoid inequalities in the track. These inequalities necessarily produce more or less torsion or strain upon the axles, in directions

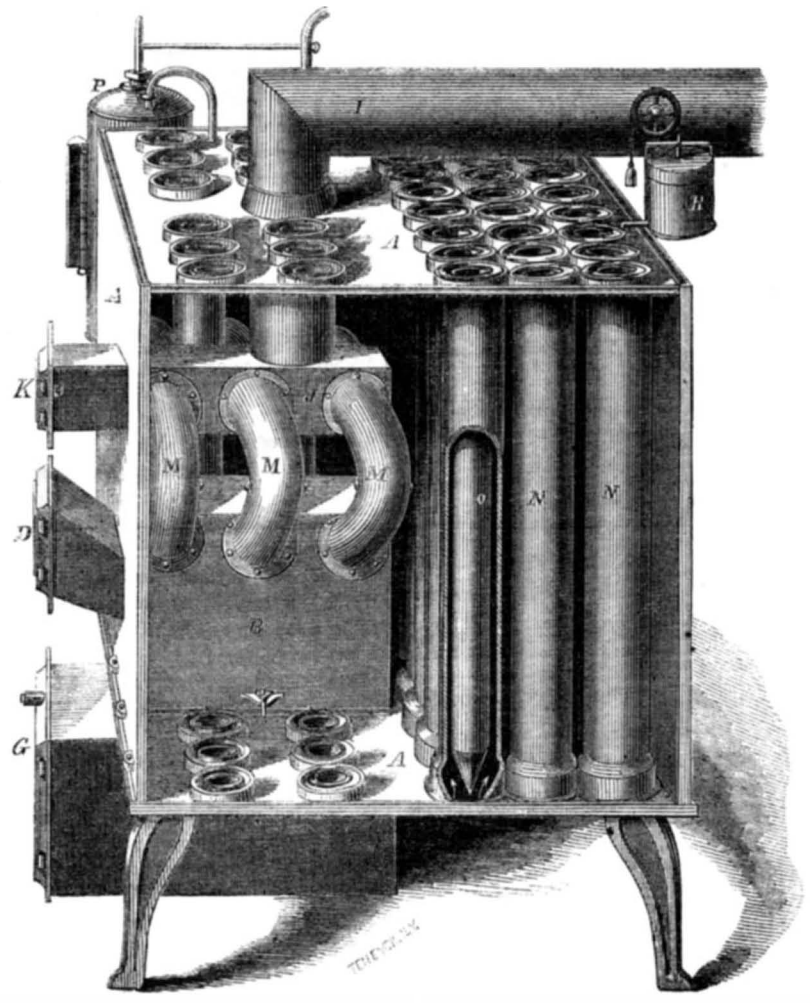
ALLEN'S RAILROAD CAR AXLE BEARING.



at angles with the perpendicular of the plane of the axle. This strain is relieved entirely by means of concave and convex surfaces, *i*, on B and C, the wedge, C, remaining stationary as regards the case, E, and the box, B, remaining stationary as regards the axle, A. The strain, therefore, that would otherwise be thrown on the axle, and tend to produce its fracture, is by this simple means removed.

The inventor of this excellent car axle box is R. N. Allen, of Cleveland, Ohio, and a patent was granted to him for it March 23, 1858. He will be happy to furnish any further particulars upon being addressed as above.

HEDENBURG'S HOT WATER HEATER.



At this season of the year, when so many persons are fitting up heaters in their houses, ready for next winter, and are anxiously inquiring which is the best one, we have called our reader's attention to these comfort-dispensers by engraving such as we think good, and now illustrate another—the invention of F. L. Hedenberg, of this city—so that the reader can adopt that one which best suits his particular house.

Our engraving is a perspective view of this heater, with one side removed, to show the arrangement of the pipes, and some of the pipes left out, to exhibit the fire box and appurtenances.

The furnace, A, consists of a square iron chamber which contains water, (to within a few inches of the top, leaving room for the water to expand when heated,) through which a number of iron pipes, N, pass, from bottom to top, being open at both ends. Inside of each of them is another pipe, O, somewhat smaller in diameter, closed and pointed at the bottom, and acting as a deflector to divide the column of air as it enters, and also brings it in close contact with the inside surface of the box A, forming the radiating surface. The fire pot, B, is in the center of the furnace, at the bottom, and is almost entirely surrounded by water. Directly over the fire is a smoke chamber, J, which, together with six curved tubes, M, that convey the smoke from the fire to it, are entirely surrounded by water. This exposes a very extensive heated surface to the water, and keeps it up to the temperature required, with very little fuel.

It has a self-acting reservoir, P, which keeps the furnace supplied with water, and also a safety damper, R, that consists of a reservoir connected by a pipe in the bottom with the top of the furnace, A; inside of it there is a float, connected by chain and wheels with a damper in the smoke pipe, I. When the water in the furnace becomes heated above a certain point, this float will rise and close the damper and check the fire, thereby preventing the generation of steam, and keep the water, and consequently air in the house, at an even temperature. K represents a door, by which to clear out the soot and ashes from the smoke chamber, J. D is the feed door, G the ash door, by which the ashes may be taken out of the furnace. I is the smoke pipe. The arrows show the air passing in the pipes, N, at the bottom, up between them and the deflector, O, by which it is warmed, and passes into the brick air chamber that surrounds the furnace, and thence is conveyed by air pipes and registers to all parts of the building to be warmed.

It will be seen by this description that the furnace is perfectly safe, being self-acting in all its parts. The air is distributed in its most pure and healthy state. This arrangement of passing the air through the hot water vertically, by means of the pipes, N, keeps up a rapid circulation and perfect ventilation.

Letters Patent were granted for this heater March 30, 1858. Any further information will be given on application to the manufacturers, F. L. Hedenberg & Son, 58 Walker st., near Broadway, New York.

Astronomy and the Telegraph.

A series of astronomical observations have been simultaneously commenced under the directions of the Coast Survey, at the Dudley Observatory, Albany, and Mr. Rutherford's private observatory in Second avenue, this city. Each observatory is furnished with an astronomical clock, a recording register and a transit instrument. A galvanic current is constantly passing through each clock from a battery outside, and this current is interrupted at every beat of the pendulum, and the clock is made to record its own vibrations upon the register.

When the atmosphere is clear at New York and Albany, the stations being connected by telegraph, the clock at the latter city is put into the galvanic circuit and its beats are heard at the same instant in New York. When a star passes the meridian at Albany, the astronomer there, as it crosses the thread of his transit instrument, strikes his key, and the observation is recorded telegraphically on the registers at both stations. When the same star reaches the meridian at New York, the observer telegraphs its passage to Albany, and thus the passage of each star as it is seen at the two different stations is recorded in both places. In this way an accurate comparison of the times of the two cities is made. When several observations have been first made at Albany, the astronomical clock at New York is put into the circuit, and the operations continued back and forth in order to obtain perfect accuracy.

HINTS IN SEASON.—Always sign your name and give the full Post Office address in every letter you write. Do not be afraid of too much definiteness upon this matter—many letters sent to us cannot be answered for want of it. If you expect an answer by mail inclose a stamp to prepay return postage—this is no more than fair. If you send a model attach to it a paper, card, or have your name and residence marked on it; this will save a great deal of trouble. Prepay express charges when it is possible to do so; when it is not, remit an amount sufficient to cover the expense. By observing these simple rules everything will go on smoothly.

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Scientific American.

NEW YORK, JUNE 12, 1858.

What Constitutes a Good Patent Claim.

We are frequently amused and sometimes annoyed at the broad and foolish claims suggested to us by inventors, and the pertinacity with which many of our clients adhere to their erroneously conceived ideas as to the manner in which a claim should be framed, to properly embrace their inventions and protect them from evasion and infringement. A lively interest on the part of inventors, on the subject of the legal security in their inventions is but natural and just, but its exercise too often stultifies the judgment, and prevents it being governed by manifestly more wise and experienced counsel. To properly draw the specification and claims of an invention or discovery, it is necessary that a general knowledge should be had of inventions and improvements for the same purpose, and all others that relate to the machine, manufacture, or process for which it is designed, as well as a proper understanding of the nature of claims generally; and hence it follows that an inventor can seldom be found who can construct a claim which will be acceptable at the Patent Office, and clearly embrace his entire invention. It very often occurs that an inventor, in his zeal to fully cover his invention, makes his claim so broad as to render it nugatory in effect, or, from a lack of comprehensiveness and detail, embarrasses the examiner at the Patent Office in distinguishing the real merits and vital parts of the invention desired to be secured.

There appears to be a wrong impression with many inventors as to what constitutes a good and proper patent claim. They often object to one when confined to a combination of parts essential to a certain result or operation, on the ground that such a claim is more likely to be evaded and infringed upon than where a special claim is made to the arrangement, construction, or form of an essential part. Now this mode of reasoning does not always hold good, as in many cases the novelty of the invention is of such a character as to make it impossible to secure it in any other way than in combination with other parts, and very often this combination claim is stronger than if the arrangement, or construction, or form of the additional part constituting the invention were specifically claimed, as these latter can often be so altered as to avoid the charge of infringement, and yet produce an equally beneficial, and in many cases analogous effect. There are, moreover, cases of meritorious inventions where, if the arrangement, construction, or form of certain parts were claimed, their success at the Patent Office would not only be endangered, but in the event of patents being secured under such circumstances, in addition to being worthless on account of the specific character of the claims as stated, they would fail to secure to the inventors the exclusive protection to which they were legitimately entitled; whereas, if the parts were claimed in combination with other essential ones, they would be what is generally termed strong and good claims admitting of general and broad applications. The right to the celebrated Woodworth planing machine was held under the claim of the combination of the rotating cutters with pressure rollers, or analogous devices; and this combination claim was subjected to a more scrutinizing judicial test than any other ever secured by patent. There are again other inventions which, if secured under a combination of parts would be futile, and hence it is that to dissect, discriminate, and select the novel and important parts to be claimed, and embrace them in the peculiar form and phraseology to make them acceptable at the Patent Office, requires knowledge, judgment and skill of that peculiar kind which cannot usually be found, except among those who are thoroughly acquainted with the contents of the Patent Office, and are conversant with the business of procuring patents. We would therefore advise inventors who have not had much experience in patent matters, to employ some competent agent in whom they have confidence, to conduct their cases before the Patent Office.

A case in point has recently occurred in our own practice which illustrates this view. A Pennsylvania inventor recently called upon us, who brought some half dozen of his inventions, every one of which had been rejected. He wanted advice. The only reason assigned by the Patent Office for rejecting his claims was the imperfect manner in which his papers were prepared. Upon examination we found that some of his inventions were novel, but his specifications and claims were drawn up in the most absurd and incongruous style, that his drawings were anything but artistic in their execution, and that as a whole his papers were nothing but a mass of error and confusion. Under such circumstances the rejection of his papers by the Commissioner of Patents was of course perfectly justifiable. The papers were prepared by and embodied the ideas of the applicant, and it was difficult to convince him that they were faulty in any respect.

All persons are prone to approve of their own productions, and it is notorious that some inventors have a *peculiar* weakness in this respect. It is an old proverb among lawyers that "he who pleads his own cause has a fool for a client." This is equally true of inexperienced inventors. They generally make a botch of their patent papers, and after a long delay are glad to seek that professional advice and assistance which, had it been employed at the outset, would have saved them much money and a great deal of annoyance.

The Atlantic Telegraph Again.

We have received a communication on this subject from A. Hall, of Washington, D. C., and as we have not room for it *in extenso*, we will present its substance. He states that one most important point has been entirely overlooked in all the experiments made with the cable up to the present time, regarding its operative powers if laid in the Atlantic. In the reports published we are told that such and such a person has succeeded in sending dispatches through the entire length of cable, and that Professor Hughes has transmitted three or four words per minute; and the company and the scientific world are congratulated upon the electrical part of the work being ensured. The point to which Mr. Hall wishes to direct special attention is, that in all the experiments thus made to send messages through the entire cable, the two ends of it have been brought together, which makes but one-half of the circuit when the two ends are two thousand miles apart, as the water of the Atlantic must form one-half of the circuit (the return) when the cable is laid. "All the experiments made," he says, "have been based upon the assumption that there will be nothing but the cable to operate through when stretched across the ocean, whereas every electrician knows that the water forms the return stretch; and the electric wave must not only travel the entire length of the cable, but must return through the water, which is not so good a conductor as copper by 33 per cent. It therefore follows that the return part of the electric circuit is equivalent to adding three thousand miles to the cable, making a total of five thousand miles of a circuit. Until experiments are made to compensate for the water part of the circuit, it is premature to claim the problem of telegraphing through the Atlantic as solved, especially as it is with extreme difficulty they have been able to send reliable signals through less than one-half the circuit."

Mr. Hall is correct in his statements, so far as we can recollect, in reading the accounts of the experiments to which he refers; but the London papers may not have given full and correct descriptions. Considering the amount of talent engaged in these experiments, it will be surprising if the important point alluded to has been overlooked. We have seen accounts of our countryman, Mr. Hughes, having been more successful than any of the English electricians in operating the cable, but how his success was obtained has not been explained.

If this telegraph cable should be successfully laid, and if only two words can be sent through it per minute, it will but be the pioneer of other lines; and such improvements will be made, we doubt not, but that messages will be ultimately sent through the ocean with much greater rapidity. It has been stated that it will require a battery of no less than five hundred cells to operate the Atlantic cable.

Extension of a Patent.

In the month of November, 1837, a patent was granted to William Crompton for an improvement in power looms for weaving fancy and figured fabrics, but before the inventor was able to derive sufficient remuneration from his invention, he was smitten with mental aberration. When the first term of his patent expired, it was extended for seven years by the Commissioner of Patents, and some hopes, it seems, were then entertained that poor Crompton might recover, and be able to secure some benefits for himself and family. These hopes proved delusive. The dark cloud still hung upon his mind, and he is now, it is stated, "hopelessly insane." As this patent would expire on the 27th of November next, the conservator of Crompton (Edson Fessenden) petitioned Congress for its further extension for seven years, and the bill for his relief came up for final passage in the Senate on the 22d ult. On this occasion some interesting information in regard to such matters —as exhibiting the opinions of Senators— was elicited.

Senator Clingman, of North Carolina, said that he had "examined these patent extension cases a great deal in the other House, and never met with one which he thought ought to pass. In fact, for the last five years, but *one* has got through the other House, and that was done under the previous question, without a word of discussion. If this bill ought to pass it was an exception to all bills of this character which he ever had occasion to examine."

Senator Dixon, of Connecticut, the pilot of the bill, stated that the case was one of a very peculiar character, commending itself to the sympathy of the Senate.

Senator Yulee, of Florida, "considered this bill rather upon the principle of a pension than an ordinary extension of the patent."

The inventor had not derived any benefit from the extension of his patent, on account of his malady; and those who manufactured and used the looms embracing the improvement had petitioned for the extension of the patent, stating that they were willing to continue paying the patent fee. A clause in the bill provides that *any* person may make and use these looms by paying a fee of fifteen dollars for each. This throws the invention open to the public upon the condition of contributing something—and that but a very moderate sum—for the maintainance of the poor lunatic inventor and his family. These considerations had great weight with the Senators, and the bill was passed.

From the substance of the remarks made by all those who spoke on the occasion, it is evident that a just and severe scrutiny is now exercised in Congress in relation to all petitions and bills for the extension of patents, and we are confident it will be impossible for Colt, McCormick, and others, to whom we have alluded in former articles, ever to get extensions.

Patent Suit—India-Rubber.

In the United States Circuit Court, this city, Judge Ingersoll presiding, an important case was decided on the 1st inst. The parties were Conrad Poppenhusen, complainant, against the New York Gutta Percha Comb Company, defendants. The suit was brought to recover damages for infringing two patents of L. Otto and P. Meyer, one issued Dec. 20, 1853, and the other April 4, 1854, both assigned to the complainant. The first patent was for oiling or greasing the surface of gutta percha or india-rubber preparatory to being vulcanized, to make what is known as the "hard compound" for making combs and such like articles. The oil was applied to prevent the surface of the prepared gum adhering to the molds or covering, during the vulcanizing process. The second patent was for covering the surface of the vulcanized gum with tinfoil or its equivalent flexible metal pressed in contact with the surface of the gum to preserve the form during the vulcanizing process.

The defense set up was, first, that the defendants did not infringe; and second, that, L. Otto and P. Meyer, the patentees, were not the original and first inventors. During the trial, it appeared that the defendants had only used the oiling process covered by the first patent for a short time, but it was proved that they had used the process covered by the second patent, and were still using it.

Damages of $100 were awarded for the infringement of the second. and of 6 cents for the infringement of the first patent. These decisions sustained the validity of both patents. The case was contested at great length, and occupied the Court eleven days. For plaintiff, C. M. Keller and F. B. Cutting; and for defendants, George Gifford, and E. W. Stoughton.

More Gold Discoveries.

Recent accounts from California bring intelligence of a most fervid excitement having been caused in San Francisco by reports of very rich gold placers having been discovered on Frazer river, north of Oregon, in the British possessions. It is stated that large companies have left California for the new gold regions, which are very extensive.

In Iowa, gold has lately been discovered in several counties, but we believe it is not plenty, and that it will scarcely pay fifty cents per day for digging and washing. A correspondent, alluding to the gold field of Iowa, in which he has been laboring, says "three days of exploration with a spade, had enabled him to discover several small grains of gold and several tuns of exaggeration."

The Infected Ship.

Two suggestions for the disinfecting of the *Susquehanna* have come to us from Missouri. One is to whitewash the whole vessel after the application of chlorine; and the other is to burn charcoal in small braziers up and down the ship, it being closed up. This would convert all the air in the ship to carbonic acid and free nitrogen, which, our correspondent thinks, would kill the malaria. A Michigan friend suggests that the inside planking should be taken out, and lime slacked between her bulkheads. He is also desirous of obtaining a contract for performing this operation.

SEWING MACHINE CONTROVERSY.—We have received a note from Geo. H. Wooster in reference to the sewing machine controversy noticed in our last week's paper. He declares that Watson's claim to priority on the "roughened surface and spring pressure feed" has not been abandoned, that an appeal has been taken from the Examiner's decision, and that the question of priority will be fought out to the bitter end.

We beseech all the parties to this quarrel to conduct it as peaceably as possible, and not to forget the good old-fashioned advice applied to children not to "let their angry passions rise."

REJECTED CASES.—Inventors having rejected cases in the Patent Office, and not satisfied to abandon their claims, will find it greatly to their advantage to correspond with Munn & Co. Such cases receive their prompt and particular care.

WE are indebted to Hon. J. W. Sherman, Hon. John Cochrane, and Hon. W. H. Seward for Congressional documents.

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Electricity.

MESSRS. EDITORS—Among the physical sciences there is, perhaps, none more interesting to all classes than electricity. The reasons are obvious; it admits of ocular demonstrations of the most pleasing character. Electricity, like light and heat, is one of the imponderables—we know nothing of it except in connection with matter. There is a hypothesis that meets with much favor with many able philosophers, viz., that there is an etherial agent pervading space, and when acting on matter in one form produces light, in another form heat, in another, electricity. The imponderables, in many respects, are analagous. Light is composed of undulations, of which there are 52,000 in a single inch, and it moves 192,000 miles per second. Electricity also moves in a wave, or undulatory form, and travels 576,000 miles in a second. By the single fluid theory (which to me appears the most rational) Dr. Franklin succeeded in accounting for all the electrical phenomena. The two conditions he termed "plus" and "minus;" yet the theory of two fluids is quite universally adopted, and is much the most convenient. If the nerve connected with the stomach of any living animal be separated, and the poles of a galvanic battery applied to the stomach, digestion goes on as perfectly as before separation; and yet it has been clearly shown that the nervous force is not electricity. Again, if the poles of a powerful battery be applied to the nerves of a human subject soon after life is extinct, all the phenomena of life are produced in the most marked degree, such as the raising and depressing the chest, as in powerful breathing, opening and closing the eyes and mouth, appearances of mirth and anger, and even pointing the finger and shaking the fist. Some experiments of this kind have been of such an extraordinary character that many present have been induced to believe that life had actually returned, and that the subject was about to take vengeance on all in the room. This is one form in which this mysterious agent is made to manifest itself. In another form we see it entering the workshop, a humble companion and faithful servant; diligently searching the liquid solution for minute particles of silver, and carefully depositing them in a metallic form, according to whatever pattern is presented to it. One electric battery will perform the work of about twenty men by the old way, and it will be infinitely more perfect. In still another form it becomes our faithful messenger, conveying glad tidings to distant friends; or the mournful intelligence of departed relatives. It travels on a slender thread of wire beneath the ocean depths, or over the mountain steeps, through wind and storm, the gloomy forest, or darkest night, and it delivers with truthfulness whatever message is intrusted to its care.

In another form we behold this wonderful agent taking up a permanent residence in the delicate points of the mariner's compass, and pointing, with unerring certainty, the course to be taken over unknown waters, thus enabling man to make the trackless ocean a highway. By this simple form of electricity the destiny of empires have been controlled. Where would America, with all her greatness, have been to-day, or what would the commerce of the world be, without electricity in the mariner's compass? Let those opposed to improvements and developments of genius answer. Another useful application of this agent is the blasting of rocks in our harbors, and the throwing down of stupendous cliffs, to make a track for the locomotive. Many feats have been performed in blasting that would have been impossible without the aid of electricity. Many attempts have been made to use it as a motive power, but the result has not been very successful. In all cases it has been found to be more expensive than steam; yet the results have perhaps been as encouraging as in the early attempts to use steam. Here is a wide field for inventors.

The application of the lightning rod was a great achievement in conducting this subtle fluid harmlessly from our dwellings and ships. The loss to the British navy was enormous previous to the successful application of the lightning conductor by Sir Wm. Snow Harris, since which I believe not a vessel has been lost by lightning.

Electricity is the most subtle and powerful agent in nature. We behold the sturdy oak, the pride of the forest, whose strong arms have withstood the rude winds for centuries, bow in an instant to a single stroke of this mysterious agent. The most refractory substances in nature, which refuse to yield to the strong blast of the furnace, are instantaneously deflagrated by this agent. We behold it in the beautiful coruscations of the aurora borealis; it forms the nucleus of the terrible tornado; it is heard in the thunder, and felt in the earthquake.

I have thus very briefly noticed some of the phenomenon of this wonderful agent; and although it has been applied to many useful purposes, it would be ridiculous to suppose that all its useful applications have already been developed.

To my fellow-mechanics let me say, bear in mind that the Deity thundered over the heads of men for about six thousand years, to arouse their intellect, before a Franklin and a Morse responded to the call of the Great Infinite. Young America may well be proud of the names of these philosophers and inventors; but while we have made such progress in the arts and sciences, we should never be unmindful of the duty we owe to the great Creator of these powers of nature, who has given them to man as wonderful agents, to be employed for his good. L. A. ORCOTT.

Albany, N. Y., June, 1858.

How to Make Soda Ash.

Some time ago, in an article entitled "How to make Oil of Vitriol," we gave a full description of the processes usually employed in the manufacture of that commercial acid; and we now propose to carry the reader a step further into one of the numerous applications of this most useful of acids.

Carbonate of soda, British alkali, or, as it is most commonly called among the manufacturers, "soda ash," is used as the practical source of alkali, and in a great measure it is also used as a source of carbonic acid. There is scarcely any chemical process which can be carried on without its aid, and it forms (when pure) the most useful re-agent of the laboratory.

The price is regulated by the actual percentage of pure soda or oxyd of sodium which it contains, and this is ascertained in an ingenious and simple way. The weight of soda being accurately known which will combine with a definite weight of carbonic acid, or in other words, the equivalent proportions of their composition being well established, and it being equally well known what amount of pure vitriol will combine with the same weight of soda, it is only necessary to make such a solution of vitriol that one measure of it (this measure is arbitary) will exactly combine with 1 per cent of soda in any compound, and the means for testing the amount of soda is at hand.

A quantity of soda ash is taken, say one huhdred grains, and dissolved in warm water; a piece of litmus paper reddened by acid is then placed in the soda ash, and it instantly becomes blue from the alkaline nature of the solution. Then a quantity of standard vitriol is added (that is, vitriol made so that one measure equals one per cent of pure soda) drop by drop, with frequent stirring, until all the carbonic acid is expelled, and the vitriol has taken its place in combining with the soda; the moment all the soda is saturated with the stronger acid, the litmus paper again begins to redden, and the number of measures of acid taken to produce this change gives exactly the amount of soda in the ash.

Now to manufacture this soda ash is a somewhat difficult process, because carbonic acid is one of the weakest of acids; and to make it replace the acids (such as muriatic, sulphuric, and nitric) which are usually found combined with soda, and at the same time render the processes sufficiently cheap to enable soda ash to be produced in large quantity, was a problem for chemists to solve. It has been solved by the united aid of many chemists; and it is questionable to whom the honor of being the father of modern alkali-making belongs. We are inclined to believe that Tennant, of Glasgow, deserves the greatest share of credit.

Soda occurs in nature most plentifully in the form of common salt, or as chemists call it, chloride of sodium; and therefore this is naturally the foundation of all compounds of soda which are produced as triumphs of the chemist's art. But how to displace this strong acid (hydrochloric or muriatic) by another? To do this we must summon to our aid the powers of mighty vitriol.

A quantity of common salt, generally about four hundred pounds, is placed in an iron pot, which is so built in the fire-place of a furnace that the flames and heated gases all play over it, and then a quantity of vitriol is added. A workman keeps the whole stirred with an iron ladle or spade, while the fire plays on it for four or five hours, until the whole of the chlorine gas is driven off as muriatic acid, and sulphate of soda remains in the pot, this is called "salt cake." Neither the pots or ladles last very long, and the iron from them aids much in the contamination of the salt cake, which is scraped out while hot, and in a semi-fluid, or rather, viscid state, on to the ground, where it is allowed to cool. This is then broken up, and mixed with small coal and lime. This mixture is then heated for many hours on the hearth of a reverberatory furnace until the whole has assumed a plastic state, when it is raked out into iron barrows, and the hydro-carbon vapors burst from the heated mass in tongues of yellowish-blue flame—technically called 'candles." This product is "black ash," and contains the carbonate of soda, or soda ash, which has to be extracted from it by water. When sufficient solution is obtained, it is run into a suitable shallow evaporating pan, exposed to a high heat, and as it loses the water the mass is well agitated, to prevent crystallization, and the product is the soda ash of commerce. When crystallized soda is required, the solution of the black ash is placed in vessels, and allowed to evaporate slowly, when the crystals form with ten equivalents of water combined with them.

The refuse, or insoluble portion of the "black ash," has been found to contain many valuable organic compounds; and we have no doubt that shortly some cheap method will be discovered of making this refuse the fountain of the cyanides—the ferro and ferricyanides—and other equally valuable salts, all of which will tend to cheapen the staple, carbonate of soda.

Egg-shaped Cisterns.

A correspondent—Thomas H. Johns, of Point Worthington, Miss.—informs us that egg-shaped water cisterns are becoming very general in the South and West, and that they are far superior to the flat-bottomed cisterns common at the East. The following is a description of the method of constructing the above-named cisterns:—

"The ground is excavated to a greater depth at the center than at the sides, and rounded gradually towards the greatest width or circumference; this forms the bed of an inverted arch. The bricks are laid in hydraulic cement, by commencing at the center, and when the arch bottom is formed, the side walls and top arch are constructed in the usual way."

Our correspondent has had large cisterns of twenty feet diameter built in this manner, and he assures us they never fail when the workmanship is properly executed. Flat bottomed cisterns we know often leak, but this we have considered to be the fault of the workmanship. The masons do not generally make the bottoms of cisterns sufficiently thick, nor do they use a requisite amount of cement for the bed. As the egg-shaped cisterns have no edge or angle at the bottom, of course they are capable of withstanding a greater amount of hydorstatic pressure than the flat bottoms, and are, therefore, not so liable to leak.

Railroad Returns.

A correspondent of the New York *Tribune*, writing from Philadelphia, asserts that the Pennsylvania Central Railroad, which is 345 miles long, only cost about one-half as much as the New York and Erie Railroad; the latter, however, is 100 miles longer. Its returns, it seems, are nearly as large as the Erie, therefore it must be in a prosperous condition. Its income from January 1st, 1858, until April 1st, was $1,717,449; that of the Erie during the same time, $1,719,211; and the Baltimore and Ohio line, (386 miles long,) $1,327,752. It is stated that about one hundred emigrants, in search of farms, go over the P. C. R. R. daily; the cars provided for them are of a superior character to those belonging to emigrant trains on other railroads.

Curious Phenomenon.

The *Meuse* of Liege states a curious circumstance. Pieces of ground situated between the Rue Berthotel and the Bassin du Commerce, in that city, have for some time past been calcined and heated to a certain depth, whilst no vegetation could thrive on them, and the wine, and other things placed in the cellars of houses, became spoiled. The causes of this phenomenon, though frequently sought for, could not be discovered. A few days ago an extraordinary event occurred; some men on removing the stone covering of a well on the Quay D'Avroy, and bringing a lamp to it, saw, to their astonishment, a blue flame arise and burn for some time, thus making the fact evident that the ground is impregnated with an inflammable gas, which must have emanated from the neighboring coal seams.

Economical Scents.

As cheap perfumes are often required to fill little fancy bottles, such as are sold at the bazaars, toy shops, arcades, and other places, the following recipes for their manufacture will be found of service:—

1.—Spirits of wine, 1 pint; essence of bergamot, 1 ounce.

2.—Spirits of wine, 1 pint; otto of santal, 1 ounce.

3.—Spirits of wine, 1 pint; otto of French lavender, ½ ounce; otto of bergamot, ½ ounce; otto of cloves, 1 drachm.

4.—Spirits of wine, 1 pint; otto of lemon grass, ¼ ounce, essence of lemons, ½ ounce.

5.—Spirits of wine, 1 pint; otto of petit grain, ¼ ounce; otto of orange peel, ½ ounce.

—*Piesse's Art of Perfumery.*

Hints to Entomologists.

A rather curious advantage has been taken of the insect-eating propensities of the toad. A gentleman had killed a toad at a very early hour one morning, and after skinning it for the purpose of stuffing the skin, he dissected its digestive system. The contents of the stomach he turned out into a basin of water, and found there a mass of insects, some of them very rare and in good preservation. Afterwards, he was accustomed to kill toads for the express purpose of collecting the insects that were found within them, and which, being caught during the night, were of such species as are not often found. The same experiment elicited another curious fact—namely, the great tenacity of life possessed by some insects. Before pinning out the insects that were found, and which were mostly beetles, they had been allowed to remain in the water for several days, and were apparently dead, yet when they were pinned on cork, they revived.

Lead Pipes.

It has been found that water containing lime does not corrode the lead pipes through which it may flow; and therefore when such pipes are laid down, it is advisable to give them a coat or two of lime, and leave themto dry thoroughly before water is passed through them.

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Correspondents

D. W. B., of Pa.—Place a pulley where you may on an upright shaft, you cannot gain power thereby. The power of a man is equal to raising 100 pounds 1 foot in a second, or 36,000 pounds 10 feet in ten hours.

A. Y. McD., of Mo.—Most animal oils become thick at temperatures between 50° and 32°. Oil never could be employed as you seem to suppose, in thermometers. Alcohol, not mercury or oil, is used in the Arctic regions for thermometers.

W. D. F., of Mass.—Wheat is superior to corn for making starch. The process of manufacturing starch embraces peculiar machinery and apparatus. It would require drawings and a long description to convey to you a proper idea of it.

R. A. D., of N. J.—The lightest and best anti-corrosive metal for sail hanks is aluminum, but it is too dear to use for this purpose. Galvanized iron is not suitable; it would soon corrode at sea. Brass composed of half zinc and half copper, is the best we can recommend.

James P. Hitchcock, of Homer, N. Y., wishes to correspond with some one engaged in the manufacture of coiled springs.

E. A. H., of Ill.—Centrifugal pumps, which are so common, are similar to circumferential vent water wheels, usually called "reaction wheels."

J. McB., of Mo.—To harden the header of your nail machine, after it is heated red-hot, turn it face upward, slightly inclined, and let a stream of cold water fall upon its face from a hight of six or seven feet. By this method of tempering it will not be liable to crack, and it will be rendered very hard, provided your steel is of the proper quality.

H. W. E., of Pa., and W. J. S., of N. Y.—We know that telegraphers employ means to conduct atmospheric electricity to the earth at stations, in order to prevent surplus charges fusing the connections and destroying the electro-magnets. The correspondence to which you refer related to a "new" metal, not employed before, possessing peculiar powers for this purpose.

A. H. P., of Ohio.—If you boil cloth in a solution of alum, and dry it thoroughly, it will be rendered partially impervious to water without obstructing perspiration.

J. O., of N. H.—A narrow strip of tin fixed across the top of a lamp wick, or a piece of platinum or brass wire inserted in it, spreads out the flame, and allows it more free contact with the oxygen of the atmosphere, thus producing perfect combustion and a brighter flame. The argand burner exhibits this principle in the most perfect manner, by bringing the air in contact with both the inside and outside of the wick and flame. The answer to the correspondent referred to by you, gives the address of A. Pierz, this city.

C. F. S., of Ill.—A solution of sal ammoniac will not remove moles from the face. We are not acquainted with any safe solution that will effect this object.

N. E. L., of Ind.—The brass-work of watches is not covered on the surface with a varnish; nor is any substance put on the surface to give it the rich color you mention; it is the natural color of the alloy after exposure to the air. An oxyd of iron mixed with cast iron, smelted for several days out of contact with the air, renders the metal softer and malleable. We are not acquainted with a gold-colored solder that melts at a low heat, and is capable of being used in jewelry.

James M. Goodwin, Bethel, Clermont co., Ohio, wishes to correspond with pump owners and manufacturers.

G. F. S., of La.—It is indeed shameful on the part of boot and shoe makers to fill in under the sole with bits of paper, shavings, &c. The only remedy is to avoid the purchase of such shoes, and patronize your own shoemakers. "Haste makes waste." We should consider your chances for a patent on the saw teeth improvement as very doubtful. Could judge better from a sample of your saw.

C. B. J., of Mass.—There is no more power in a long, than in a short handle of a screw-driver; but the long handle admits of the operative applying his power in a superior manner.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, June 5, 1858:—

H. N., of N. Y., $30; A. E., of L. I., $55; G. E., of Pa., $25; W. M., of Iowa, $25; H. & S., of N. Y., $15; J. C. D., of Ky., $25; L. R.. of Pa., $250; L. B., of Ala., $25; W. R., of Mich., $27; C. & N., of Ill., $30; A. D., of N. C., $5; A. C. R., of R. I., $30; S. F. J., of Ind., $25; E. R., of Wis., $30; E. S., Jr., of N. Y., $30; S. C. C., of Mich., $25; M. C. C., of N. Y., $25; F. B. N., of N. Y., $125; J. W. W., of Ind., $30; J. V., of N. J., $30; W. S. T., of N. Y., $30; G. W., of Conn., $27; E. M., of Mich., $35; J. D. S., of Ohio, $30; G. M., of Mass., $30; S. R. W., of Ill., $30; R. S. M., of Ohio, $30; D. H., of N. Y., $55; W. T. B., of Ohio., $30; A. W. H., of Conn., $30; S. H. G., of Conn., $25; J. H. B., of R. I., $43; C. T. P., of N. Y., $460; A. B., of Pa., $65; M. & C., of Ill., $25; G. E. C., of Minn., $27; T. E. McN., of Pa., $55; K. & F., of Texas, $30; J. T., of N. H., $25; P. T. T., of Vt., $30; G. W. B., of L. I., $30; I. H. C., of Ohio, $27; E. M., of N. Y., $10.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, June 5, 1858:—

H. & S., of N. Y.,; J. C, D., of Ky.; G. E., of Pa.; S. F. J., of Ind.; G. E. C., of N. Y.; J. P., of L. I.; M. C. C., of N. Y.; G. K., of Ind.; A. E., of L. I.; W. S. T., of N. Y.; W. M., of Iowa; W. R., of Mich; A. D., of N. C,; G. M., of Mass.; C. & M., of Ill.; G. W. C., of Ill. . J. T., of N. H.; S. H. G., of Conn.; Z. C., of Ill.; G. W., of Conn.; I. G., of N, Y.; A. B., of Pa.; B. H. W., of Mo.; S. C. C., of Mich.; I. H. C., of Ohio; J. H. S., of Md,; F. B. N., of N. Y.

Literary Notices.

THE YELLOW FRIGATE; OR, THE TWO SISTERS. By Capt. James Grant. We have received from Dick & Fitzgerald, No. 18 Ann street, this city, a fifty cent novel bearing the above title. As we have neither the time nor the disposition to read novels current at the present day, we are therefore unable to speak of their literary merits. The publishers of the "Yellow Frigate" would not put an immoral work to press.

EDINBURGH REVIEW—Published by Leonard Scott & Co., 54 Gold street, this city.—The number for the present quarter of this—the parent of all the British Reviews—is worthy of its palmy days, when Sidney Smith, Hazlitt and Jeffrey were contributors. It contains an essay on the "Annals of California;" a review of Edgar A. Poe's works, a very favorable one, and another on the "Life of George Stephenson," the real railway king. Besides these reviews, there are six others of equal ability on different subjects.

THE NORTH BRITISH REVIEW—Published by L. Scott & Co., No. 54 Gold street, this city—The May number contains an excellent review, entitled the "Philosophy of History." "Professor Owen's Works," and "Lieut. Maury's Geography of the Sea" are the titles of two very able articles. These are very interesting, and written with the usual brilliancy of the British essayists.

BLACKWOOD'S MAGAZINE—Published by Leonard Scott & Co., No. 54 Gold street, New York—The number for this month of this veteran and able magazine is a good one. It contains an able essay on "Food and Drink."

THE ECLECTIC MAGAZINE.—The June number contains a very excellent selection of articles, the one entitled "Speeches of Lord Brougham," and the three on "Gen. Havelock," of whom there is also a handsome portrait, being especially worthy of perusal.

HUNT'S MERCHANTS' MAGAZINE for June contains two capital articles on "Usury," and "Gold and its Effects," and, as usual, this valuable periodical comes laden to us with information of the most useful kind. It is published at 142 Fulton street, New York, by G. W. and J. A. Wood.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of twelve years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 128 Fulton street, New York. We have lately established a Branch Agency on the corner of F. and Seventh streets, Washington (opposite the United States Patent Office). This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it.

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Communications and remittances should be addressed to MUNN & COMPANY,
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The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

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Yours, very truly, CHAS. MASON.

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Science and Art.

Naphtha Fluids.

In the neighborhood of the river Irawaddy, in the Burmese empire, there are a number of wells, from which naphtha, or fluid petroleum, is obtained. The natives employ it raw in their lamps for illumination, as a preservative of timber from insects, and as a medicine. Considerable quantities of it are now imported into England in hermetically closed metallic tanks, as it is partly volatile at common temperatures. In London, England, at Price's celebrated candle works, it has been recently employed for the purpose of manufacturing various useful products employed in the arts. It is first distilled with steam of 212° temperature, and yields various liquids of different specific gravities—the lightest coming over first. These liquids are all colorless, and are solvents of india rubber. The lightest liquid (which boils at 80°) is a useful detergent, and is employed to remove grease and oil stains from silk without impairing its delicate color. We have never heard of the naphtha of any of the numerous springs in America being distilled for such a useful product. Liquids of ·627 and ·860 specific gravity are also obtained from naphtha at a second and third distillation, and burn with a brilliant white flame in a lamp; they cannot be ignited without a wick, even when heated to the temperature of boiling water, therefore they are perfectly safe for domestic use.

How to Whiten and Beautify the Hands.

A well-formed hand, white and soft, with tapering fingers and polished nails, is a rare gift; but where nature has denied these possessions, it is easy, by proper attention, to give at least softness and delicacy of appearance to the hand, and improve the symmetry of the nails. An exchange recommends the wearing of kid or soft leather gloves at every opportunity, light being preferable, on account of the unctuous substances with which they are prepared, although not so healthy, and the application of a warm bran poultice to the hands once a week. They should be washed in tepid water, as cold water hardens and predisposes them to roughness and chaps, while water beyond a certain heat makes them shrivelled and wrinkled. In drying them, they ought to be rubbed with a moderately coarse towel, as friction always promotes a soft and polished ivory appearing surface. The soaps to be preferred are such as are freest from alkaline impurities. The growth and preservation of the nails depend, in a great measure, upon the treatment they receive. They ought to be frequently cut in a circular form, and the whitened portion at the root, next the vessels which supply the nail with nutriment for its growth and preservation, should always be visible. When the nails are disposed to break, some simple pomade should be frequently applied, and salt freely partaken of in the daily diet.

Arsenic in Wall Paper.

A number of cases have, at various times, been brought before the public, regarding persons who were supposed to have had their health injured by the bright arsenic green color of new paper with which the walls of their rooms were covered. It was supposed that part of the arsenic in this color was volatilized by the warmth of the apartment, and by floating in the atmosphere was inhaled, and thus caused injury to the inmates. To test the accuracy of such statements, the London *Engineer* states that A. Abel has made a series of experiments in a room, the walls of which were covered with new green paper, containing about two-tenths of a grain of arsenic to each square inch of surface. The room was, during the first experiment, kept closed for thirty-six hours, and then the air in it was drawn through a solution of the nitrate of silver for five hours, and afterwards through a tube filled with asbestos moistened with ammonia nitrate of silver. Not a trace of arsenic was thus detected in the air. He then passed air heated to 90° Fah. over strips of arsenical paper hanging for a week, at the rate of a cubic foot every two hours; and he then tested this air also with ammonia nitrate of silver, but no arsenic was found to have been volatilized.

The conclusion at which Mr. Abel arrived from his experiments is, that no injurious consequences can arise from wall paper colored with arsenical pigments giving off any of the arsenic. He believes that the cases of persons reported to have been injured in health by such wall paper were not correct; that the sickness of the parties was due to some other cause, and was wrongly attributed to the arsenic in the green paper.

Mr. Abel may be correct in his conclusions so far as his own experiments are concerned; nevertheless, it is a well-known fact that those operatives who are engaged in the preparation and printing of arsenical pigments suffer in their health from the arsenic, and nothing else. We therefore deprecate the employment of arsenic in painting, printing, or any of the common arts of life.

DOTY'S FRUIT GATHERER.

This fruit gatherer is intended for all those kinds of fruit which grow upon large trees, but it is more especially intended for gathering apples, which are now usually picked by hand. When fruits fall on to the ground, they become bruised and injured so much that in a few weeks decay sets in and they will not keep, so when it is desired to keep any fruit through a winter or for consumption early in the next year, the fruit is picked by hand, which is not only a long and tedious process, but one which adds considerably to the expense of the fruit. This apparatus, the invention of Wm. Doty, of South Hartford, N. Y., enables the apples to be gathered by shaking the bough, and catches them on a soft and yielding material, so that they do not become bruised, nor do they fall to the ground.

Our engraving is a view of one of these apparatuses spread under a tree, and also illustrates the method adopted for detaching the fruit by means of a pole. The fruit gatherer is a frame on four legs, A, which can be lengthened and shortened as desired by means of sliding pieces; from this frame project bars, *a*, that are kept "taut" by means of cords and hooks, and these pieces, *a*, enable a greater surface to be spread by the apparatus. The frame can be moved from place to place or from tree to tree by means of the handles, *b b*, of which there are a pair on each side. From the pieces, *a*, is suspended a cloth, C, which has a square hole in its center, and is stitched on three sides to the inclined cloth bed, *d*. There are also two other cloths, B B′, suspended from *a*, and any apples falling from the tree on to the cloths pass down over the inclined cloth. *d*, on to a grating, *x*, through which the smaller apples pass, and the large ones will go down the spout, E, into the bag spout mouth, E, from which they can be packed in barrels, boxes, or other convenient receptacle. The smaller apples drop gently on a lower grating, *x*, through which the sticks, leaves, and other foreign substances can pass and allow the apples to roll down the spout, G, into the spout mouth, H. Should the apple not be very regular in its form, it will not roll from the grating, but will stay upon it to be removed by hand, thus the apparatus will only deliver such apples as are marketable, and divides them into sizes fit for the same place. The gatherer is a long pole, I, having a hook. *i*, at one end, which can be made to grasp the bough by means of a lever and a wire from the handle to the hook, with this the bough is shaken and the fruit falls off.

It was patented Oct. 27, 1857, and the inventor will be happy to furnish any further particulars.

Some of our cotemporaries state that a seam of coal, six feet thick, has been discovered near Toronto, C. W., and great excitement has been caused thereby. Geologists have reported that there were no coal formations in that region.

Brussels Lace.

The spinning of the fine thread used for lace-making in the Netherlands is an operation demanding so high a degree of exquisite skill, minute manipulation, and vigilant attention that it appears impossible that it can ever be taken from human hands by machinery. None but Belgian fingers are skilled in this art. The very finest sort of this thread is made in Brussels, in damp underground cellars, for it is so extremely delicate that it is liable to break by contact with the dry air above ground; and it is obtained in good condition only when made and kept in a humid, subterraneous atmosphere. There are numbers of old Belgian thread-makers who, like spiders, have passed the best part of their lives spinning in cellars. This sort of occupation naturally has an injurious effect on the health, and the eye-sight of the operatives is impaired at an early age.

A Hint to Builders.

In the accounts received of a great fire that recently occurred at St. Katharine's Dock, London, it is stated that property worth from $25,000,000 to $30,000,000 would, no doubt, have been laid in ruins, had it not been for the peculiar construction of the buildings. In the first place, the structures were over ninety feet high, but they were formed into divisions, each having thick party walls and double iron doors of great strength. The girders of the various floors were built upon what are technically termed "chairs," so that in the event of one of the upper floors falling, there would be no danger of the weight carrying the lower floors with it.

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